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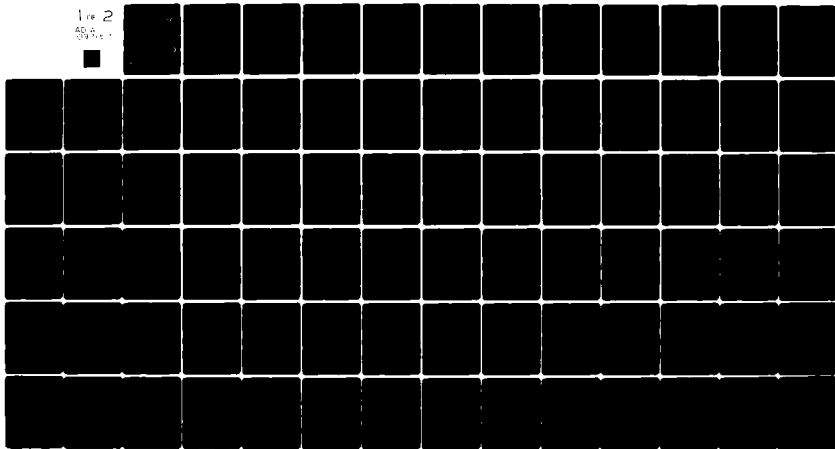
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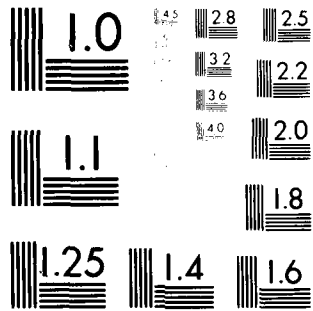
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ANALYSIS OF A STUDY ENTITLED
CIVILIANIZATION OF
NAVY FLEET SUPPORT SHIPS
PREPARED FOR THE
JOINT MARITIME CONGRESS,

15 December 1980

Contract No. N00014-79-C-0040

ISI Report No. V-0514-02A

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) This study was undertaken at the request of the Deputy Chief of Naval Operations (Logistics) to compare the cost analyses in the CIVMAN study (Investigation of the Potential for Increased Use of Civilian Manning on Fleet Support Ships) and the March 1980 draft JMC Study (Civilianization of Navy Fleet Support Ships).		

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EXECUTIVE SUMMARY

This report is the result of an analysis of a March 1980 draft report prepared for the Joint Maritime Congress (JMC), entitled "Civilianization of Navy Fleet Support Ships." In order to clarify certain cost issues in that report, a set of questions was sent to the JMC and these were answered on 22 October 1980. In the JMC Report, it was claimed that considerable cost savings were possible if the 95 Navy auxiliary ships (representing 13 types) were transferred to commercial contract manning. In computing the cost savings, the JMC analysis was based on only three types of ships; viz, AO, ATF, and AF. The results obtained in their cost analysis of those three ship types were then extrapolated to the additional ten types of auxiliaries: the AOR, AOE, AE, AFS, AR, ARS, ASR, AD, AS, and ATS. If all 95 ships were transferred to commercial contract manning, they estimated potential savings of about one billion dollars annually.

The JMC Report, however, ignored the differing roles, missions and manning philosophies of those ships. The original CIVMAN Study, issued by OPNAV in July 1978, claimed that civilian operation of these ships was feasible, but it treated each ship type individually and specifically described the manning needs and operational capabilities. Thus, the JMC Report ignores:

- 1) The AD and AS intermediate maintenance role.
- 2) The need for critical skills shore rotation aboard tenders.
- 3) The special role of the AOR and AOE as part of a task force so that they cannot be placed in Reduced Operating Status (ROS).

- 4) The need to use auxiliary ships as training platforms for command and combatant training billets.

In view of these considerations, the extrapolation of the personnel and dollar savings of the AF, AO, and ATF to the other ten ship types is not really applicable. Therefore, this analysis concentrated on only those ship types which were treated in detail by the JMC study.

Among the vessels the Military Sealift Command (MSC) presently operates are three types of auxiliary ships: the AF-58, AO-105, and ATF-158. The operating costs of these ships were used as the basis of the JMC conclusions. The CIVMAN Study, however, had estimated the costs of operating the new AO-177 and TATF-166 classes. Thus, in order to compare similar ships, this analysis developed cost comparisons for the AO-105, AO-177, ATF-158, ATF-166 and AF-58.

In order to accurately compare the results of the JMC study and to update the costs based on the experience of the last three years of operation under the MSC, the following set of cost estimates were prepared:

- 1) An estimate of the ships' cost using the MSC manning and wage scale for the Navy Civil Service option, and the U.S. Maritime Administration (MarAd) suggested manning and wage scale for the commercial contract option.
- 2) An estimate of the ships' cost using the MSC Nucleus Ship Expense Reports. These reports are the actual costs which were charged the fleet for the operation of specific ships.
- 3) Ships' cost estimates using the JMC furnished data. This was a recomputation of both civilian options to consider the data used by the JMC. The purpose of the computation was to take into account the method used by the JMC Report and make it consistent with the accounting system used by the MSC.

- 4) A listing of the results from the JMC Report to evaluate a side-by-side comparison of the differences.

The results of these analyses are shown in Table I. The reasons for the differences between the estimates of this analysis and the JMC Study are as follows:

- 1) Use of a 1.6 men per billet ratio for Civil Service Cost while MSC is authorized 1.22 men per billet and funded for a leave account of approximately 30%.
- 2) Double-counting of shore, annual, and sick leave for MSC.
- 3) Incorrect application of OMB Circular A-76 factors in the Civil Service manpower cost.
- 4) Application of indoctrination and training, retirement, life and health insurance, leave, and social security to the inflated Civil Service manpower cost (inflated base pay multiplied by the 1.6 men per billet ratio).
- 5) Inclusion of social security as a cost of Civil Service manpower when they are exempt from social security.
- 6) Addition of overhaul cost to operating cost without annualization in the Civil Service and commercial contract options, but its retention in the military option.
- 7) Exclusion of profit or general agency fee as a cost element in the commercial contract option.
- 8) Exclusion of shore utilities in both the Civil Service and commercial contract options, but its retention in the military option.

The JMC also claimed that the Navy ignored overhead cost. These cost items, however, are included in the Navy estimate under logistics support in indirect O&MN.

Additionally, the JMC claim of an annual \$23 million overhead cost savings was based on an analysis which ignored the important military collateral duties of MSC personnel.

The estimates made in this report of Navy military manpower expenses result in costs less than the Civil Service manpower costs. This reflects the Navy practice of not manning all billets. It is noted that these Navy military manpower savings are offset when total costs including maintenance are estimated.

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TABLE I
SUMMARY OF MANPOWER REQUIREMENTS,
MANPOWER COST AND TOTAL OPERATING COST

Total Manpower Requirements

Ship Class	Navy Military	Navy Civil Service		Commercial Contract	
		CIV77	JMC	CIV77	JMC
AF-58	250	134	130	123	113
AO-177	198	108	-	103	-
AO-105	299	121	126	104	103
ATF-166	47	20	-	35	-
ATF-158	97	33	34	34	30

Total Manpower Costs (\$000 FY 77)

Ship Class	Navy Military	Navy Civil Service		Commercial Contract	
		CIV77	JMC	CIV77	JMC
AF-58	3,038	3,860	4,827	4,248	3,512
AO-177	2,543	2,999	-	3,933	-
AO-105	3,523	3,727	5,374	4,078	3,990
ATF-166	632	663	-	1,370	-
ATF-158	1,177	1,160	1,631	1,240	1,146

Total Operating Costs (\$000 FY 77)

Ship Class	Navy Military	Navy Civil Service		Commercial Contract	
		CIV77	JMC	CIV77	JMC
AF-58	7,084	6,797	8,118	7,213	7,303
AO-177	9,051	5,815	-	6,782	-
AO-105	10,549	7,725	9,428	7,997	10,251
ATF-166	2,462	1,817	-	2,623	-
ATF-158	3,043	2,529	3,165	2,652	2,866

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I. INTRODUCTION

In January 1977, the Chief of Naval Operations directed an in-house study to examine the costs, risks, capabilities, and benefits of civilian manning of Navy fleet support ships. The three options considered were Navy Military personnel, Navy Civil Service mariners, and commercial contract mariners. The results of this analysis were published in a July 1978 report entitled "Investigation of the Potential for Increased Use of Civilian Manning in Fleet Support Ships" (CIVMAN). The analysis, made at a time of severe fiscal constraints and potential future military manpower shortfalls, was one of several initiatives by the CNO which attempted to redress the supply/demand problem in the context of total force manpower management. CIVMAN reached no conclusions, but analyzed the implications of the three alternatives, both quantitatively and qualitatively. The study was considered the baseline for examining increased civilian manning, and was to be utilized in conjunction with other developing concepts for manning the fleet.

Subsequent to the publication of CIVMAN, the Joint Maritime Congress (JMC) commissioned a study by Ruttenberg, Friedman, Kilgallon, Gutchess, and Associates, Inc., to evaluate the CIVMAN Study. The JMC Report, issued in draft form in March 1980, took issue with the findings of the CIVMAN Study.

Consequently, the Navy Department has requested a comparison of the costs in the JMC Report and CIVMAN to account for the

differences. This document is the result of the comparison and analysis, and will be referred to as CIV77.

This cost comparison required the reconciliation of the methodologies of CIVMAN, which was planning oriented, and the JMC Report, which is oriented toward highlighting cost savings.

The JMC Study consisted of a detailed analysis of 3 ships (AF 58, AO-105, and ATF-158) which were used to make several fleetwide cost extrapolations. These extrapolations served as the basis for the commercial contract cost savings claimed in the JMC Report. Differences in structure and mission between auxiliary classes do not justify such extrapolations, and they are thus beyond the scope of CIV77.

CIVMAN computed detailed bottoms-up costs for all 13 auxiliary classes. In particular, it included the AO-177 and ATF-166 since these were new hulls entering the fleet at that time. CIVMAN also included the AF-58, which is the only ship of its kind in existence.

In order to make the requisite detailed cost comparison, CIV77 priced out the AF-58 plus the oiler and tug in each study: the AO-177 and ATF-166 from CIVMAN, plus the AO-105 and ATF-158 from the JMC Report.

For these five ships, it was necessary to reconstruct, update, and supplement the crews from CIVMAN and compare them to the crews in the JMC Report. The crews resulting from this manpower analysis in Section II were used in this cost analysis, which produced four estimates.

- 1) An estimate of the ships' cost using the MSC manning and wage scale for the Navy Civil Service option, and the U.S. Maritime Administration (MarAd) suggested manning and wage scale for the commercial contract option.
- 2) An estimate of the ships' cost using the MSC Nucleus Ship Expense Reports. These reports are the actual costs which were charged the fleet for the operation of specific ships.
- 3) Ships' cost estimates using the JMC furnished data. This was a recomputation of both civilian options to consider the data used by the JMC. The purpose of the computation was to take into account the method used by the JMC Report and make it consistent with the accounting system used by the MSC.
- 4) A listing of the results from the JMC Report to evaluate a side-by-side comparison of the differences.

These estimates were separated into manpower costs, developed in sections IV, V, and VI, and non-manpower operating and support (O&S) costs, developed in sections VIII, IX, and X. This separation allowed the analysis to proceed in concert with OMB Circular A-76. The basic conclusion of this study is that Civil Service operation is less expensive than commercial contract operation, and this is discussed in sections VII and XI.

II. MANPOWER REQUIREMENTS COMPARISON

In order to develop the cost comparisons, it was necessary to establish crew sizes for each class of ship. Table 1 compares the manpower requirements for the operation of each ship in this analysis. The crew sizes utilized were derived from the original CIVMAN Study and are found in the columns labeled CIV77. Those used by the Joint Maritime Congress study are found in the columns labeled JMC. The column labeled SMD was derived from the Ship Manning Document for those ship classes.

TABLE 1
MANPOWER COMPARISON
(CIVILIAN SEAMEN/NAVY MILITARY DETACHMENT)

Ship Class	Manpower Requirements				
	Navy Military SMD	Navy Civil Service CIV 77	Service JMC	Commercial Contract CIV 77	Contract JMC
AF-58	250	116/18	113/17	96/27	96/17
AO-177	198	89/19	-	84/19	-
AO-105	299	105/16	110/16	88/16	87/16
ATF-166	47	16/4	-	25/10	-
ATF-158	97	27/6	28/6	24/10	24/6

The differences in the number of personnel result from different manning philosophies between the Navy Military and the two civilian options. The Navy provides a considerable number of personnel for range and depth in watch standers at ship operating and control stations, for maintenance, and for damage control. However, the Navy Civil Service and the commercial contract managers place reliance upon unattended equipment and the employment of off-watch personnel during underway replenishment (UNREP)

operations. The two civilianized options have limited capability to repair combat damage, fight fires, or sustain casualties.

In addition, Navy military manned ships provide many administrative services such as laundry, pay, postal services, and ships stores. There is also a requirement to provide training aboard ship, since approximately 40% of the Navy crew is non-rated. Tables A-1 through A-5 are the SMD or equivalent manning levels for the five military manned ship classes.

The civilian crews were sized to provide the anticipated peacetime demand for services, and both options require similar manning levels. Both the MSC and MarAd estimates are based on merchant marine manning practices. Optimization of manning is achieved by cross-training off-watch personnel for UNREP operations, and scheduling work hours to match support requirements.

Differences among the civilian options in manning requirements do not adhere to a pattern in the case of the AO-177, AO-105, and AF-58. MSC may require more personnel on watch than commercial contract operators or vice-versa. MSC tends, however, to provide shipboard administrators, such as pursers and storekeepers, whereas commercial contract operators do not.

The CIVMAN Navy Civil Service crews were obtained from MSC based on a functional analysis of the tasks required to ensure peacetime mission performance and ship maintenance. The estimates, which include the Civil Service personnel and the military detachments required for ship operation, are shown in tables A-6 to A-10.

In the original CIVMAN Report, MarAd provided the commercial contract manning estimates for the ships, except for the ATF-158 which was constructed specifically for this analysis. The MarAd estimates are also based on a functional analysis of the tasks required to accomplish the assigned peacetime missions and to perform ship maintenance. These MarAd crew sizes are the same ones used in the CIVMAN study. Tables A-11 to A-15 contain the crews for the commercially manned ships.

The JMC Report proposed that the ATF-158 be crewed with one less mate and one less licensed engineer in the commercial contract option. This evidently requires the Master and Chief Engineer to stand watches, which is permissible on coastal voyages of short duration. However, a full quota of 4 deck and 4 engineer officers are preferred for transocean towing or voyages of long duration, where endurance becomes a factor on this type of non-automated ship.

In the original CIVMAN Report, MarAd required the study group to determine the size of the MILDETs. That study group chose to use the current Navy SMD to identify functions not normally performed by civilian seamen, and to propose that functions so identified be performed by military personnel in the numbers and skill levels required had the ship retained the Navy military crew.

Although MSC has elected to operate with a four man MILDET on the ATF-166, the CIVMAN study group chose to use the ten-man communications division authorized by the current SMD as its estimate for the commercial contract manning case. This vessel

is built to Coast Guard and American Bureau of Shipping (ABS) rules for civilian manning. Space and weight reservations allow for increased accommodations should the civilian crew be replaced with a military one. In its present configuration, only 16 civilian seamen and 4 military personnel can be billeted, but "troop" type accommodations for a 20-man transient salvage team are provided.

A close examination of billet descriptions in all three JMC manning scales revealed minor differences in skill levels, but these differences do not significantly impact upon the performance of the ship as a whole in meeting its mission requirements. Thus, CIV77 used the JMC civilian crew and base pay as the basis for one cost estimate.

However, in terms of the military detachment, there is no basis for the JMC Report to argue that the MILDET is the same for both civilian options. The MILDETs used in the JMC Report are taken from CIVMAN and are from a different class ship for the oiler and tug. CIVMAN estimated the AO-177 and ATF-166, while the JMC Report estimated the AO-105 and ATF-158. An examination of table 1 will show the minor differences in MILDETs between these ships. For consistency, CIV77 used the MILDETs provided by MSC for Civil Service cost purposes and those developed, updated and supplemented from CIVMAN for commercial contract cost purposes. The automation differences alone argue that military detachments cannot be extrapolated across ship classes.

III. ECONOMIC COST ANALYSIS

For the ease of the reader and in order to avoid the need to refer to the original CIVMAN Study, a brief summary of the cost models used in CIV77 is provided in this section. All costs computed are in annualized FY 1977 dollars, and the comparison is of undiscounted economic cost to the United States Government. The CIVMAN and JMC studies both used this cost measure. The manpower costs were separated from the non-manpower O&S costs to meet the requirements of OMB Circular A-76 concerning private sector versus government provision of services. The next three Sections (IV, V, and VI) explain and present the manpower cost of each option, and the the non-manpower O&S costs are covered in Sections VIII, IX, and X. The manpower costs are compared in Section VII, and the total costs are compared in Section XI.

The cost element structure for this analysis is shown in Table 2. This cost analysis considers only those costs which vary with the manning alternative. Thus, Ship Construction Navy (SCN) cost per ship, Base Operating Support (BOS) cost per ship per year, and Fleet Modernization Program (FMP) Installation cost per ship are not included in this analysis and are assumed consistent across all three alternatives.

Changes in operational practices and availability of new data since the publication of the CIVMAN Report required modification of the CIVMAN methodology. In particular, military manning was updated to the current level, and the cost was assumed to be 85% of the SMD crew expense. This reflects more closely the actual reduced crews aboard the Naval auxiliaries.

TABLE 2
ECONOMIC COST ELEMENT STRUCTURE

Operation

Direct

Civilian Stores and Supplies

Fuel

Utilities

Repair Parts

Other

Indirect

Logistic Support

Maintenance

RA/TA (Restricted Availability/Technical Availability)

Selected RA

IMA (Intermediate Maintenance Activity)

Overhead

Manpower

Navy Crew

Billet Cost

Foregone Taxes

Civilian Crew

To provide a clear comparison among the estimates for the three types of ships, the following cost methodology was utilized:

- 1) An estimate of the ships' cost using the MSC manning and wage scale for the Navy Civil Service option, and the MarAd suggested manning and wage scale for the commercial contract option.
- 2) An estimate of the ships' cost using the MSC Nucleus Ship Expense Reports. These reports are the actual costs which were charged the fleet for the operation of specific ships.
- 3) Ships' cost estimates using the JMC furnished data. This was a recomputation of both civilian options to consider the data used by the JMC. The purpose of the computation was to take into account the method used by the JMC Report and make it consistent with the accounting system used by the MSC.
- 4) A listing of the results from the JMC report to evaluate a side-by-side comparison of the differences.

Profit Consideration

There is a lack of consensus among the MSC and MarAd officials concerning the treatment of profit in the commercial contract option. The question is whether a commercial contract operator's general and administrative expenses (G&A) plus profit should be estimated at \$200 per day maximum or by the 10% G&A and 15% profit method. The choice of the method makes a difference in the non-manpower O&S costs of \$250,000 per year for the ATF-166 and \$800,000 per year for the AO-105. The \$200 per day maximum fee results in a lump sum added to other expenses. This analysis added the \$200 per day lump sum to the non-manpower O&S costs.

The JMC study did not address the amount of profit and gave the following explanation in response to that question:

Profits for the Commercial Contract option were not included as part of the Commercial Contract costs. Although some profits would undoubtedly be involved in the use of Commercial Contract crews, the level of profit would be dependent, among other things, on the method of contracting used and the state of the market at the time of the contracting. It was thus decided that the comparison in the study should focus on identifiable costs, excluding profits.

Fleetwide Cost Extrapolations

The JMC study estimated fleetwide cost savings which were based on the results of their detailed cost analyses of three ships. These results were then extrapolated in various ways across all 95 auxiliaries. They explained their methodology as follows:

Three representative ships have been chosen for review: an AF-58 (dry cargo), an AO-105 (oiler), and ATF-158 (fleet tug)... In computing total costs for the fleet, it sometimes was necessary to assume that the percentage savings on these types of ships will apply across the board.

This assumption on the part of the JMC ignores the following points:

- 1) The AD and AS intermediate maintenance role.
- 2) The need for critical skills shore rotation aboard tenders.
- 3) The special role of the AOR and AOE as part of task forces, so that they cannot be placed in Reduced Operating Status (ROS).
- 4) The need to use auxilliary ships as training platforms for command and combatant training billets.

For these reasons, this analysis is concerned with only the five hull types which were either in CIVMAN or the JMC Study: AF-58, AO-177, AO-105, ATF-166 and ATF-158.

IV. NAVY MILITARY ECONOMIC MANPOWER COST

The economic manpower costs are based on the Navy Billet Cost Model (NBCM), which estimates the annual life cycle cost to DOD for manning a particular billet aboard a ship in terms of rate and rating. To obtain the cost to the government, the foregone tax on benefits is added to the Navy billet cost. NBCM cost inputs include the following:

Base Pay	Clothing Allowance
FICA (Employer's Share)	Mess Cost
Recruiting Costs	Commissary/Exchange
Training Costs (Incl. Support)	Subsistence Allowance
Retirement Contribution	Death Gratuity
Reenlistment/Bonuses/Settle- ment Cost	Medical Cost
Proficiency Pay	Accession Travel
Hazardous Duty Pay	Training Travel
Family Separation Allowance	Change of Station
Separation Payments	Separation (Travel)
Serviceman's Life Insurance	BAQ
Tuition Assistance	Sea Pay
Dependent's Schools	Foreign Duty Pay

Due to the fact that the Federal Income Tax is not applied to allowances, the taxes thus foregone were considered to be a cost incurred by the Government for Navy Military personnel. Foregone taxes were estimated by determining for each enlisted and officer pay grade from the Federal Withholding Tax tables, the tax rate (i.e., percentage) applicable to the composite rate for that grade. The tax rate established for each pay grade was applied to the allowance portion of the composite cost for that pay

grade. The resultant foregone taxes by pay grade were then weighted by the number of personnel of each pay grade on each type of ship. In establishing these tax rates the Naval Military Personnel Command suggested assuming 3 exemptions for officers and 2 for enlisted personnel. All personnel were assumed to be married.

The actual calculations in this study, as in both the CIVMAN and JMC studies, used the mean billet cost to simplify the computations. The original CIVMAN study conducted a sensitivity analysis which showed that there was less than 1% error in the total manpower cost when mean billet costs were used in place of the rate and rating calculation. The officer and warrant officer billet costs were estimated based on earlier billet cost computations. These costs are shown in Table 3.

In this analysis, the final manpower cost was defined to be 85% of the SMD level or its equivalent as explained above. This is a conservative reflection of operational Navy manning experience. The Navy crews are shown in Table 4, and the resulting costs are shown in Table 5.

TABLE 3
NAVY MANPOWER COSTS BY PAY GRADE*

<u>PAY GRADE</u>	<u>(ECONOMIC) BILLET COST</u>	<u>FOREGONE TAX</u>
O-6	\$72,714	\$1472
O-5	50,598	1187
O-4	40,752	977
O-3	35,394	982
O-2	30,382	611
O-1	22,316	405
W-4	40,778	972
W-3	33,311	749
W-2	28,488	591
W-1	24,977	493
E-9	26,704	939
E-8	24,121	780
E-7	21,611	682
E-6	18,258	573
E-5	14,538	511
E-4	12,043	389
E-3	10,582	324
E-2	9,898	287

*These costs were effective as of 1 October 1976

TABLE 4
NAVY MANNING BY PAY GRADE*

GRADE	AF-58	AO-177	AO-105	ATF-166	ATF-158
O-6	-	-	1	-	-
O-5	1	1	-	-	-
O-4	2	1	1	-	-
O-3	3	3	5	1	1
O-2	3	4	3	1	2
O-1	2	1	3	-	1
W-4					
W-3	1	2	2	-	-
W-2	1	-	-	1	2
W-1	1	-	-	1	-
E-9	2	-	2	-	-
E-8	1	-	-	1	1
E-7	9	13	12	3	2
E-6	19	23	20	6	8
E-5	42	35	26	12	19
E-4	49	46	72	6	19
E-3	79	69	117	12	36
E-2	35	-	35	3	6
TOTAL	250	198	299	47	97

*The crews represent the grades listed in the most current SMD or PSMD.

TABLE 5
NAVY MILITARY MANPOWER COSTS
(FY 77 \$000)

AF-58	\$3,038
AO-177	\$2,543
AO-105	\$3,523
ATF-166	\$ 632
ATF-158	\$1,177

V. NAVY CIVIL SERVICE MANPOWER ECONOMIC COST

Four estimates were made to develop the Civil Service manpower cost for the TAF-58, TAO-105, and TATF-158. These were:

- 1) Estimates using the MSC manning and wage scales.
- 2) Estimates using the Nucleus Ship Expense Reports (NSER).
- 3) Estimates based on the JMC furnished data.
- 4) The actual JMC estimate taken from their report.

For the TATF-166 and the TAO-177, estimates were made using 1, 3, and 4 above, because these ships were not yet in the fleet and thus no Nucleus Ship Expense Reports are available for them. The data for these two ships are the same as that which was used in the CIVMAN study. The TAF-58 planning data was updated by MSC for this analysis. Planning data exists for all five ships in question. The manpower cost element structures for these two sources are shown in table 6.

CIV77 Estimates Based on MSC Manning and Wage Scales

The MSC provided two sources of data for Civil Service manpower costs: the manning and wage scale (planning data), and the Nucleus Ship Expense Reports (operational data). The first source is the one used originally in CIVMAN and the JMC study. However, the JMC study, arguing that actual operational costs should be utilized whenever possible, used the Nucleus Ship Expense Reports to project their non-manpower O&S costs, and the manning and wage scale costs for their manpower costs. The justification for this procedure is explained on page 29 of the JMC Report as an adjustment for full crew manning because MSC

TABLE 6
NAVY CIVIL SERVICE
MANPOWER COST ELEMENT STRUCTURES

MSC Wage Scales

Nucleus Ship Expense Report*

Base Pay	Regular Time (51011 & 51012) ^{1/}
Overtime	Overtime (5102)
Premium Pay	Relief Officers (5103)
Subsistence	Bonuses (5104)
Travel	Shore Leave (5105)
Annual, Sick, and Military Leave	Other Premium Pay (5107)
Medical and Life Insurance	Annual, Sick and Military Leave (5108)
Relief	Indoctrination and Training (5109)
Awaiting Assignment	Awaiting Assignment (5110)
Training	Indigenous Labor (Direct & Indirect Hire) (51111 & 51117)
Damage Control Instruction	Health Benefits Contribution (Employers) (5112)
Shore Leave	Retirement Contributions (Employers) (5113)
Workmen's Compensation	Life Insurance Contributions (Employers) (5114)
	Social Security Taxes (Employers) (5115)
	Subsistence (5121 & 5123)

*These are designated "Labor and Related Costs" and "Subsistence". The entire Nucleus Ship Expense Report Cost Element Structure is shown in Table 24 in the Navy Civil Service non-manpower O&S costs section below.

^{1/}The numbers presented in parenthesis are the Nucleus Ship Expense Report account numbers.

ships frequently sail without filling all billets. Because of this, it was necessary to develop both the operational manpower cost and the planned manpower cost to the extent that data was available.

All civil service manpower cost data from both sources were analyzed by adjusting the costs in accordance with OMB circular A-76 dated March 29, 1979. This document directs that civil service retirement be priced at 20.4% of base pay, federal employee life and health insurance be priced at 3.7% of base pay, and that workmen's compensation, bonuses, and awards plus unemployment insurance be priced at 1.9% of base pay. In addition, shore leave was priced at 10.5% of base pay in the planning data according to MSC procedure.

The cost estimates from the MSC planning data are derived in Tables A-16 to A-25. The first table in each set prices out the base pay; the second prices out the remaining manpower costs to derive total direct and indirect manpower costs, and then adds the military detachment cost and 5% MSC overhead to obtain the total Civil Service manpower cost. These costs are summarized in this section. The base pay figures are shown in Table 8, column C; the total direct and indirect manpower costs are shown in Table 9, column C; and the total manpower costs are shown in Table 10, column C.

CIV77 Estimates Based on Nucleus Ship Expense Reports

The cost estimates derived from the Nucleus Ship Expense Reports required the following adjustments to fit the methodology used in this report. First, Civil Service retirement (account

number 5113) was repriced at 20.4% of the base pay in the NSER. This necessitated removing the cost reported under social security taxes (5115), since this is the cost incurred by MSC for newly employed civil servants who are not yet permanent government employees. The actual pension cost is thus a total of accounts 5113 and 5115.

Life and health insurance were priced at 3.7% of base pay. Workmen's compensation, bonuses and awards, and unemployment programs were added at 1.9% of base pay. These costs are not present in the NSERs, although an account number is reserved for bonuses. All of these manpower costs, amended and unamended, were then added to the subsistence (account 5121) and indoctrination & training (account 5109) costs from the NSERs to obtain the total direct and indirect manpower costs. The further addition of the military detachment cost and MSC overhead results in the total Civil Service manpower costs. These computations are shown in Tables A-26 to A-28. In addition, the base pay figures are shown in Table 8, column D, while the total direct and indirect manpower costs are shown in Table 9, column D, and the total manpower costs are shown in Table 10, column D.

JMC Cost Analysis Methodology and Results

The JMC study methodology used wage schedules and manning scales provided by MSC but which differed from those used in this study. The manning scales used by the JMC were priced out to obtain a total base pay figure for each ship. This figure was then escalated by adding the following items to derive the total cost of manpower: reserve officers (via the 1.6 men per billet

ratio), overtime, relief officers, indoctrination and training, retirement, life and health insurance, shore leave, annual, sick and military leave, and social security. The exact computations from the JMC study are shown in Tables A-32 to A-40, along with the wage and manning scales from which they were derived. The costs derived are shown in Tables 8 (columns A and B), 9 (column A), and 10 (column A).

The JMC methodology differs from that used in the original CIVMAN study and this analysis, both of which were developed in consultation with MSC. Firstly, there is a difference in wages used to represent base pay. The data provided by MSC for CIVMAN and this analysis were based on a weighted average of the three wage scales which were in effect during FY 1977. The JMC study used wage scales which came into effect later in the 1977 calendar year (and in one case January 3, 1978). Since wages rose during 1977, the scales in effect in the second half of the year are greater than the MSC-derived composite average.

Secondly, there are some differences in the actual civilian billets filled between the JMC study and those in the CIVMAN and CIV77 studies. These differences, outlined in Section II, have no impact on the ability of the ship to perform its operational mission.

Thirdly, the most crucial difference between the JMC study and this report is that the JMC multiplies the annual manning cost by a 1.6 men per billet ratio. This is discussed in detail below.

Fourthly, the JMC study uses factors to price certain categories of civil service pay which differ from the current OMB Circular A-76. In particular, civil service retirement was priced at 24.7% of base pay multiplied by the previously discussed 1.6 manning ratio, while A-76 directs that it be priced at 20.4% of base pay. The JMC study prices federal employee life and health insurance at 4% of the base pay again multiplied by the 1.6 men per billet ratio, while A-76 directs that this insurance be priced at 3.7% of base pay. In addition, A-76 directs that federal employee workmen's compensation, bonuses and awards, plus unemployment insurance be priced at 1.9% of base pay, while the JMC study did not include this cost.

Fifthly, the JMC study prices indoctrination and training as a fraction of the inflated manpower cost.

Sixthly, the JMC study estimated shore leave based on the ratio of shore leave to base pay in the Nucleus Ship Expense Reports. In the CIV77 analysis of the NSERs, the actual expenditures of shore leave from the Nucleus Ship Expense Reports were used when pricing manpower, rather than adjusting base pay for full crew manning. Again, the factor provided by MSC for the manning and wage scales estimates shore leave at 10.5% of base pay.

JMC Utilization of 1.6 Men Per Billet Ratio

The JMC study multiplies the annual manning cost by a 1.6 men per billet ratio. This is probably the most crucial difference between the JMC methodology and that used in CIVMAN and CIV77. The JMC rationale for this assumption was as follows:

...It should be noted, however, that the commercial contract (men per billet) ratio is built into the calculation in the back-up tables referred to above [reproduced in the appendix as Tables A-51, A-53 and A-55] since commercial maritime personnel receive only vacation pay and benefits when they are not actually employed aboard ship. Civil service personnel are paid their salary at all times and thus the calculations shown in the back-up tables for civil service [reproduced as Tables A-32 to A-40]...reflect the need to keep civil service mariners on the payroll if there are to be sufficient civil service personnel available to meet the man billet ratio requirements.

The JMC report also references a report prepared jointly by the U.S. Maritime Administration and the Military Sealift Command in November 1978 entitled "Civilian Seafaring Manpower Requirements in Peace and War 1978 - 1984". On page 61 of this report, the men per billet ratio for MSC is given as 1.6. The explanation provided by the authors was that this ratio is a reflection of the manpower pool needed to support the MSC manned ships. It was derived as follows:

$$\frac{\text{Number of Men Aboard Ship} + \text{Number of Losses} + \text{Number of Hires}}{\text{Number of Billets}} = 1.6$$

The MSC has further addressed this question, and argues that civil service personnel receive only accrued leave pay when they are not actually employed aboard ship. Thus, a multiplication of MSC manpower cost by a men per billet ratio overstates the actual cost, because the pay for a replacement person filling a billet is covered by the base pay while the original crew member is drawing leave pay. When a person is on leave, his salary is drawn from the accrued leave account which was built up while he was working.

This point, which covers all types of leave, can best be explained by an illustrative example.

Consider a Second Assistant Engineer who is paid at an annual rate of \$18,000 (base pay), and who accrues leave at an annual rate of 20% of base pay. Let us assume that the engineer in question works from 1 January to 30 June, goes on leave from 1 July to 31 July, and returns to the ship from 1 August to 31 December. During his one month of leave, his billet is filled by another engineer paid at the same annual rate and accruing leave at the same percentage of base pay. The cost of filling the original engineer's billet is \$18,000 in base pay and \$3,600 in accrued leave, plus the other manpower costs which are not germane to this example since they are covered in other expense categories. The cost of pay and government liability for the two individuals who actually fill the billet during the year in this example is computed in Table 7.

The original engineer received \$9,000 from 1 January through 30 June, accrued \$1,800 in leave pay during that time which was paid to him during July, received \$7,500 from 1 August to 31 December, and accrued \$1,500 in leave during that time which is credited to him at the end of the year. The cost (pay plus liability to the government) of the original engineer is \$19,800.

The substitute engineer received \$1,500 for July, and accrued \$300 leave for a total of \$1,800. This person is not charged to this ship if he is employed by MSC during the other 11 months, but to the ship to which he is assigned. The total cost

TABLE 7
ILLUSTRATIVE CIVIL SERVICE LEAVE COST EXAMPLE

	<u>Base Pay</u>	<u>Accrued Leave</u>	<u>Total Pay + Government Liability</u>
Original Engineer (1 January 30 June)	\$9,000	\$1,800	\$10,800
Substitute Engineer (1 July - 31 July)	\$1,500	\$300	\$1,800
Original Engineer (1 August- 31 December)	\$7,500	\$1,500	\$9,000
TOTAL EXPENSE (PAY + GOVERNMENT LIABILITY)	\$18,000	\$3,600	\$21,600

of these two people is \$19,800 + \$1,800, or \$21,600. Thus, the cost of substitute personnel is numerically the same as the accrued leave costs.

The civil service sailor is authorized up to 26 days per year annual leave and 13 days sick leave as well as about 9 holidays. Thus, the government assumes a financial liability for leave of about $\frac{384}{2080} = 18.5\%$. Adding to that a 10.5% liability for shore leave results in a 29% assumed government financial liability. This is the extreme because not all personnel have 15 years service which is required to earn 26 days annual leave.

In the JMC civil service manpower calculations, the base pay figures are presented on the top line of the table of indirect manpower cost calculations. The second line of these tables

escalates base pay by the men per billet ratio as a means of estimating leave costs. However, additional leave costs are computed on the second and third lines from the bottom of these tables. Thus leave is accounted for both by providing supernumeraries as well as an accrued leave account and therefore the leave is presented twice in these tables.

MSC must fund an accrued leave account. This provides for their financial liability. However, they also must obtain an authorized marine manpower ceiling to provide for the supernumeraries or reserve manpower. This ceiling amounted to .22 man years per billet or a man/billet ratio of 1.22. The JMC Report has ignored the fact that MSC operates under a ceiling point system and cannot exceed its authorized manpower level or ceiling points. Thus MSC is authorized 22% more billets than the actual number of billets aboard the ships but has a funded liability of approximately 30%.

CIV77 Estimates Based on JMC Data

The final Civil Service manpower cost analysis consisted of a recomputation of the costs using the CIV77 methodology on the JMC data supplied in Tables A-32, A-35, and A-38.

The JMC costs developed in these tables were escalated in exactly the same manner as the base pay costs obtained from the MSC manning scales and wage schedules provided for this study. A detailed explanation of this cost methodology appears above in this section, while the detailed computations performed with the JMC data are shown in Tables A-29 to A-31. The final results are shown in column B of Tables 9 and 10. The base pay figure used for escalations are found in Table 8, column A.

Comparison of Civil Service Cost Estimates

Tables 8, 9, and 10 present the JMC estimates, the estimates from this study, and the estimate of the JMC data using the CIV77 methodology which corrects for apparent misinterpretation of the data.

In each case the JMC estimate exceeded the CIV77 estimate and the costs reported in Nucleus Ship Expense Reports.

TABLE 8
NAVY CIVIL SERVICE
MANPOWER COST - CIVILIAN MARINERS BASE PAY
(FY 77 \$000)

	A	B	C	D
TAF-58	1,424	2,278	1,290	1,211
TAO-177	-	-	1,073	-
TAO-105	1,618	2,588	1,266	1,550
TATF-166	-	-	227	-
TATF-158	442	707	373	359

A - JMC cost calculated in backup tables under "total manning" cost. CIV77 Tables A-32, A-35 and A-38.

B - JMC cost in backup tables. "Total Manning" (column A) x 1.6 men per billet ratio. CIV77 Tables A-32, A-35 and A-38.

C - CIV77 cost calculated in tables A-17, A-19, A-21, A-23, and A-25.

D - Base pay from Nucleus Ship Expense Reports. CIV77 Tables A-26, A-27 and A-28.

TABLE 9.
NAVY CIVIL SERVICE
MANPOWER COST - DIRECT AND INDIRECT
COST OF CIVILIAN MARINERS
(FY 77 \$000)

	A	B	C	D
TAF-58	4,548	3,529	3,377	2,871
TAO-177	-	-	2,538	-
TAO-105	5,065	3,797	3,317	3,456
TATF-166	-	-	570	-
TATF-158	1,572	1,121	1,017	949

A - JMC cost calculated in backup tables. This estimate uses the 1.6 men/billet ratio. Calculations reproduced in Tables A-33, A-36, and A-39.

B - CIV77 analysis of JMC backup tables (CIV77 tables A-33, A-36, and A-39) which reconstructs the MSC manning cost with all billets manned. The rest of the computation uses JMC base pay to calculate civil service retirement (20.4%), Life & Health Insurance (3.7%), Workmen's Compensation (1.9%) and Shore Leave (10.5%). Adds overtime, premium/penalty pay, subsistence, other costs, annual, sick & military leave, and travel as supplied by MSC. These leave costs reflect the 1.3 financial liability. See CIV77 Tables A-29, A-30 and A-31.

C - CIV77 analysis of MSC data. Uses MSC base pay with all billets manned to calculate civil service retirement (20.4%), Life & Health Insurance (3.7%), Workmen's Compensation (1.9%), and Shore Leave (10.5%). Adds overtime, premium/penalty pay, subsistence, other costs, annual, sick & military leave, and travel as supplied by MSC. CIV77 Tables A-17, A-19, A-21, A-23 and A-25.

D - CIV77 Analysis of MSC Nucleus Ship Expense Reports. Extracts costs for "Labor and Related Costs" and "Subsistence" from Nucleus Ship Expense Reports, and adjusts civil service retirement cost to 20.4% base pay, life & health insurance to 3.7%, workmen's compensation to 1.9%, and shore leave to 10.5%. CIV77 Tables A-26, A-27 and A-28.

TABLE 10.
MANPOWER COST - TOTAL MANPOWER COST*
(FY 77 \$000)

	A	B	C	D
TAF-58	4,827	4,020	3,860	3,329
TAO-177	—	—	2,999	—
TAO-105	5,374	4,231	3,727	3,873
TATF-166	—	—	663	—
TATF-158	1,631	1,271	1,160	1,089

- A - JMC cost from backup tables 10A through 10C plus MILDET from JMC Table 14. CIV77 Tables A-34, A-37, A-40.
- B - CIV77 analysis of JMC data. Utilizes figure from CIV77 Table 9, column B, plus MILDET and 5% MSC overhead.
- C - CIV77 analysis of MSC data. Utilizes data from CIV77 Table 9, column C, plus MILDET and 5% MSC overhead.
- D - CIV 77 analysis of MSC Nucleus Ship Expense Reports. Utilizes figures from CIV77 Table 9, column D, plus MILDET and 5% MSC overhead.

* Direct and Indirect Navy Civil Service Mariner Cost also includes MILDET cost plus MSC overhead.

VI. COMMERCIAL CONTRACT MANPOWER ECONOMIC COST

As with the Navy Civil Service option, the commercial contract manpower cost analysis consists of three types of estimates:

- 1) the cost computations based on the MarAd composite data base of the various union wage scales and the constructed data for the TATF-158 which was derived from it;
- 2) the JMC cost computations based on specific union wage scales rather than the MarAd composite data base; and
- 3) the cost computations using the methodology of this analysis and the data from the JMC study.

CIV77 Estimates Based on MarAd Furnished Data

The original MarAd data base developed for the CIVMAN study was the source of commercial mariner costs for this study. That data base was a composite of several wage scales from various maritime unions in several ports. Due to the variability of this data, MarAd developed an average of these scales to obtain wages which were representative of the maritime industry as a whole.

However, the TATF-158 was not contained in that data. To obtain the cost for that crew, the total wages for each particular crew member were assumed to be the same as those provided by MarAd for the TATF-166. The TATF-158 Chief Electrician was assumed to be paid the same as one on an TASR-22. Overtime for the TATF-158 was estimated by determining the percentage of total MarAd estimated manpower cost paid as

overtime for the other four ships in this analysis. Based on this investigation, it was assumed that overtime is 28% of the final monthly wage.

The total annual manpower cost is the sum of the annual wages and training, fringe benefits, personal and indemnity (P&I) insurance, military detachment cost, general and administrative (G&A) expenses, profit, and MSC overhead.

The actual cost derivations are shown in Tables A-41 to A-50. These are divided into sets of two tables for each ship: the first prices out the direct and indirect manpower costs from the MarAd data base, while the second table aggregates the categories of this data base into the total manpower cost computations which reflect the costs of Social Security payroll tax, personal and indemnity insurance, military detachment, and MSC overhead.

Concerning the treatment of overhead and profit, the tables outlined above reflect the general agency overhead, or the maximum \$200 per day administrative fee. As noted in Section IV, this analysis adds the specific fee for each ship to the non-manpower O&S costs in Section X for purposes of deriving the total cost.

Social Security costs were estimated by multiplying the 1977 Social Security base wage (\$16,500) by the 1977 tax rate (5.85%), or \$965.25 for each crew member. It is noted that an examination of the data revealed that approximately 20% of the mariners earn less than \$16,500 in base pay, overtime, and premium/penalty pay. A sensitivity analysis revealed that the change in cost from assuming all earn \$16,500 is 5% of the total social security cost

for each ship. It was decided to estimate social security costs as a constant for each crew member for two reasons. First, the MarAd data base allocates overtime to the department only rather than to the crew member, which makes it necessary to allocate this pay for tax purposes. Secondly, MarAd advised that an additional cost for state unemployment insurance exists, but that no data is available to estimate it. This cost will reduce any overestimate of social security tax from the constant cost per man.

The P&I (personal and indemnity) insurance costs were provided by MarAd on a per person basis to each ship type, including premiums and costs for claims under the deductible. These were multiplied by the number of commercial contract crew personnel aboard each type of ship to provide an estimate of annual insurance costs per ship. The fee was estimated by MarAd on a per ship-day basis for each type of ship. This was multiplied by 365 to provide an estimate of the annual fee per ship.

Military detachments were priced in the same manner as were military personnel in the Navy Civil Service option and the Navy Military option.

Added to these costs was a 4% MSC overhead charge reflecting, among other indirect expenses, the cost of contract administration.

To estimate commercial contract costs under the 10% G&A and 15% profit method, all costs were estimated exactly as they were in the analysis described above with one exception. To the sum of the annual wages and training, fringe benefits, P&I Insurance

and military detachment costs is added an additional 10% for G&A. To this sum 15% profit is added, and to this product the 4% MSC overhead is added.

The results of these analyses are shown below. Base pay is shown in Table 11, column B, while direct and indirect manpower cost are shown in Table 12, column C. The total cost under the \$200 per day method is shown in Table 13, column C, the 10% G&A/15% profit total manpower cost is shown in Table 14, column C.

JMC Analysis of MarAd Data

The JMC cost analysis of commercial contract manpower is detailed in Tables A-51 to A-56, which consists of sets of two tables for each ship type. The first table in each set presents the manpower costs in terms of monthly rates for a particular union's scale in the MarAd Personnel Cost Reports. As in the CIV77 analysis, these tables scale the monthly cost to an annual cost. These annual costs are placed in the appropriate categories in the second table in each set.

There are three methodological differences between the JMC study and this report. Firstly, the JMC study includes relief officers in its costs, while this study does not. MarAd advises that relief officers are built into the monthly wage tables provided for this study and shown in Tables A-41, A-43, A-45, A-47, and A-49. Secondly, the JMC did not include the 4% MSC overhead, while this study did. Thirdly, the JMC study did not include P&I insurance while this study did.

The JMC base pay is found in Table 11, column A, and the JMC direct and indirect manpower cost is found in Table 12, column A. These total manpower costs are reported in Table 13, column A, while the adjacent column B includes a 4% MSC overhead. The 10% G&A/15% profit factors are also applied to column A (Tables 13 and 14) in column B of Table 14.

CIV77 Estimates Based on JMC Data

Using the JMC cost data, another cost analysis reported below was made using the CIV77 methodology. The JMC data in Tables A-51, A-53, and A-55 was modified by subtracting the cost of relief officers and replacing the JMC social security cost with a constant cost per crew member which was discussed above. These costs were \$93,000 for the AF-58, \$84,000 for the AO-105, and \$24,000 for the ATF-158. Military detachments and P&I insurance were estimated in the same manner as they were for the CIV77 analysis of MarAd data discussed above.

The base pay results are the same ones for the JMC, shown in Table 11, column A. Direct and indirect manpower costs are shown in Table 12, column B. Table 13, column D shows the total cost under the \$200 per day maximum method; Table 14, column D shows the total cost under the 10% G&A/15% profit method.

Comparison of Commercial Contract Cost Estimates

The cost analyses in this section are summarized in Tables 11 to 14. Generally, these show that the base wages were relatively similar in both this study and the JMC study. However, the costs in this study rise due to P&I insurance, and overhead costs (MSC overhead, G&A, and profit) regardless of the overhead method, or the wages upon which they were based.

TABLE 11
COMMERCIAL CONTRACT MANPOWER
COST - CIVILIAN BASE PAY
(FY 77 \$000)

	A	B
TAF-58	1,090	1,021
TAC-177	—	903
TAO-105	1,095	964
TATF-166	—	319
TATF-158	345	295

- A - JMC cost calculated in backup tables (CIV77 Tables A-51, A-53, and A-55)
- B - CIV 77 Cost calculated in Tables A-41, A-43, A-45, A-47, and A-49

TABLE 12
COMMERCIAL CONTRACT MANPOWER COST
DIRECT AND INDIRECT COST OF CIVILIAN MARINERS
(FY \$000)

	A	B	C
TAF-58	3,233	3,690	3,636
TAC-177	—	—	3,463
TAO-105	3,681	4,083	3,689
TATF-166	—	—	1,161
TATF-158	1,087	1,202	1,052

- A - JMC cost presented in Tables 11A - 11C. CIV77 Tables A-52, A-54, A-56.
- B - CIV77 analysis of JMC data. Use JMC data for all costs except social security and personal & indemnity (P&I) insurance, subtract relief officers.
- C - CIV77 analysis of MarAd data. Add to these costs P&I insurance, and constant social security estimate to cover state unemployment tax. See CIV 77 Tables A-42, A-44, A-46, A-48 and A-50.

TABLE 13
COMMERCIAL CONTRACT
MANPOWER COST - TOTAL MANPOWER COST
\$200 PER DAY MAXIMUM METHOD
(FY 77 (\$000))

	A	B	C	D
TAF-58	3,512	3,652	4,248	4,305
TAO-177	—	—	3,933	—
TAC-105	3,990	4,150	4,078	4,489
TATF-166	—	—	1,370	—
TATF-158	1,146	1,192	1,240	1,396

- A - JMC cost derived from JMC backup sheets (CIV77 Tables A-52, A-54, and A-56) plus MILDET cost per ship from JMC Table 14.
- B - Column A plus 4% MSC overhead.
- C - CIV77 analysis of MarAd data provided for CIVMAN. Table 12, column C plus MILDET and 4% MSC overhead.
- D - CIV77 analysis of MARAD data provided for JMC. Subtracts relief officers, adds P&I insurance and MILDET, computes constant social security cost, and adds 4% MSC overhead.

TABLE 14
 COMMERCIAL CONTRACT MANPOWER COST
 TOTAL MANPOWER COST
 10% G&A/15% PROFIT METHOD
 (FY 77 \$000)

	A	B	C	D
TAF-58	3,512	4,620	5,373	5,445
TAC-177	—	—	4,975	—
TAO-105	3,990	5,249	5,159	5,678
TATF-166	—	—	1,733	—
TATF-158	1,146	1,508	1,569	1,766

- A - JMC cost derived from JMC backup sheets (CIV77 Tables A-52, A-54, and A-56) plus MILDET cost per ship from JMC Table 14.
- B - Column A plus 10% profit, 15% G&A, 4% MSC overhead.
- C - CIV77 Analysis of MARAD data provided for CIVMAN. Table 12, column C plus MILDET, 10% G&A, 15% profit and 4% MSC overhead.
- D - CIV77 Analysis of MarAd data provided for JMC. Subtracts relief officers, adds P&I Insurance and MILDET, computes constant social security cost, adds 10% G&A, 15% Profit, and 4% MSC overhead.

VII. MANPOWER COST COMPARISON

Table 15 shows the Navy Military, Navy Civil Service, and commercial contract cost estimates from the three cost analyses detailed in the previous sections. In the CIV77 and JMC Data/CIV77 methodology results, civil service manpower is less costly for every ship than commercial manning. The commercial contract costs reflect the \$200 per day general agency fee.

It is noted that the Navy military manpower costs estimated in CIV77 are the least costly. However, this reflects the Navy practice of not fully manning the support ships. An analysis of the impact of this practice upon readiness is beyond the scope of this study. It is further noted that any potential Navy military manpower cost savings found in this analysis are exceeded when the total costs including maintenance are estimated.

This analysis thus finds no results to corroborate the JMC study claim that:

There is no question that a cost analysis pursuant to OMB Circular No. A-76 (as revised) and the supplementary Cost Comparison Handbook would show that the fleet support work should be contracted out to the private sector.

OMB A-76 requires a commercial cost savings of at least 10% of the government manpower costs for transfer of an activity to commercial operation on the basis of economy.

TABLE 15
TOTAL MANPOWER COST COMPARISON
(FY 77 \$000)

	<u>NAVY</u>	<u>JMC</u>		<u>JMC DATA/ CIV77 METHOD</u>		<u>CIV77</u>	
	A	B	C	D	E	F	G
TAF-58	3038	4827	3512	4020	4305	3860	4248
TAO-177	2543	-	-	-	-	2999	3933
TAO-105	3523	5374	3990	4231	4489	3727	4078
TATF-166	632	-	-	-	-	663	1370
TATF-158	1177	1631	1146	1271	1396	1160	1240

A - Navy Military Manpower Cost. Table 5

B - JMC Civil Service Manpower Cost. Table 10 column A

C - JMC Commercial Contract Manpower Cost. Table 13 column A

D - JMC Data/CIV77 Method Civil Service Cost. Table 10 column B

E - JMC Data/CIV77 Method Commercial Contract Cost.
Table 13 column D

F - CIV77 Civil Service Cost. Table 10 column C

G - CIV77 Commercial Contract Cost. Table 13 column C

VIII. NAVY MILITARY NON-MANPOWER O&S COST

The annual cost of operations for each Navy military manned ship type was taken from the July 1976 Navy Program Factors Manual (NARM) for the representative class of that type. The only indirect operating cost included was logistics support because it is included in MSC overhead costs and thus is needed for comparison of options. The annual costs of fuel and shore utilities per ship were adjusted to reflect the differences between the operating scenario for the 1977 Navy operational days at sea and that shown for the Navy military option in the NARM. These costs are shown in Table 16.

The annual cost of maintenance excluding overhaul was taken from the NARM. The unit overhaul cost shown in the NARM was accounted for in the years in which overhauls were projected to occur, as opposed to using the average annual cost in the case of the AF-58, AO-177 and ATF-166. If an overhaul was scheduled to occur in the year prior to (or the year of) decommissioning, it was ignored as unnecessary. However, in the case of the soon to be decommissioned AO-105 and ATF-158, the annualized costs of maintenance were utilized instead. Since these two ships will not be returned for operation by Navy military personnel, the cost computation is only for comparison purposes. Therefore, using the annualized cost for maintenance is probably valid. The resulting Navy military non-manpower O&S costs are shown in Table 17. Tables 18 to 22 present the costs for each element in the Navy operations and maintenance cost element breakdown structure for each ship. These estimates were made with ships under the command of CINCLANTFLT, except the AF-58, which was under the command of CINCPACFLT in 1977.

TABLE 16
FUEL AND SHORE UTILITIES COSTS
(FY77 \$000)

Ship Type	At Sea Days	Adjusted Fuel Cost	Adjusted Utilities Cost
AF	123	\$ 883	\$ 29
AO	154	\$1,778	\$ 257
ATF	161	\$ 202	\$ 68

TABLE 17
NAVY MILITARY NON-MANPOWER O&S COSTS
(FY77 \$000)

AF-58	\$4,051
AO-177	\$6,508
AO-105	\$7,026
ATF-166	\$1,830
ATF-158	\$1,866

TABLE 18
AF-58 NAVY MILITARY OPERATIONS AND
MAINTENANCE ECONOMIC COST
(FY 77 \$000)

OPERATIONS*	
REPAIR PARTS	64
FUEL	883
UTILITIES	29
OTHER	56
LOGISTIC SUPPORT (INDIRECT)	975
MAINTENANCE	
RA/TA	177
IMA	304
OVERHAUL	<u>1563</u>
TOTAL	4051

*AF-58 OPERATED IN THE PACIFIC

TABLE 19
AO-177 NAVY MILITARY OPERATIONS AND
MAINTENANCE ECONOMIC COST
(FY 77 \$000)

OPERATIONS	
REPAIR PARTS	271
FUEL	1778
UTILITIES	257
OTHER	200
LOGISTIC SUPPORT (INDIRECT)	1260
 MAINTENANCE	
RA/TA	453
IMA	190
OVERHAUL	<u>2099</u>
 TOTAL	 6508

TABLE 20
AO-105 NAVY MILITARY OPERATIONS AND
MAINTENANCE ECONOMIC COST
(FY 77 \$000)

OPERATIONS	
REPAIR PARTS	271
FUEL	1778
UTILITIES	257
OTHER	200
LOGISTIC SUPPORT (INDIRECT)	1250
 MAINTENANCE	
RA/TA	454
IMA	190
OVERHAUL	<u>2626</u>
 TOTAL	 7026

TABLE 21
ATF-166 NAVY MILITARY OPERATIONS AND
MAINTENANCE ECONOMIC COST
(FY 77 \$000)

OPERATIONS	
REPAIR PARTS	71
FUEL	202
UTILITIES	68
OTHER	178
LOGISTIC SUPPORT (INDIRECT)	517
 MAINTENANCE	
RA/TA	173
IMA	87
OVERHAUL	<u>534</u>
 TOTAL	 1830

TABLE 22
ATF-158 NAVY MILITARY OPERATIONS AND
MAINTENANCE ECONOMIC COST
(FY 77 \$000)

OPERATIONS	
REPAIR PARTS	71
FUEL	202
UTILITIES	68
OTHER	178
LOGISTIC SUPPORT (INDIRECT)	517
 MAINTENANCE	
RA/TA	173
IMA	87
OVERHAUL	<u>570</u>
 TOTAL	 1866

IX. NAVY CIVIL SERVICE NON-MANPOWER O&S COST

Two data sources were used to determine the Navy Civil Service non-manpower O&S costs in this study. For the TATF-158 and TAO-105, the Nucleus Ship Expense Reports were utilized. For the TAO-177 and TATF-166, the cost projections supplied by MSC for the CIVMAN study were utilized. For the TAF-58 both data sources were used for comparison purposes. The Nucleus Ship Expense Reports are divided into the set of accounts shown in table 24. The cost projections used in CIVMAN consisted of the categories shown in Table 23.

TABLE 23
CIVIL SERVICE COST CATEGORIES
FROM CIVMAN PROJECTIONS

Operations

Fuel

Voyage Repairs

Transportation

Port Expenses

Consumables

Miscellaneous

Overhaul and Yard Work

Utilities

TABLE 24
NUCLEUS SHIP EXPENSE ACCOUNT NUMBERS AND TITLES

OPERATING COSTS		OPERATING COSTS (cont'd)	
Account Number	Account Title	Account Number	Account Title
Labor and related costs		Supplies and services	
5101 1	Regular time (except damage control instructors)	5116	Travel
5101 2	Regular time, damage control instructors	5117	Repatriation travel
5102	Overtime	5120	Cash in lieu of subsistence and quarters
5103	Relief Officers	5130	Consumable supplies
5104	Bonuses	5136	Medical and dental expenses
5105	Shore leave	5138	Transportation and handling of supplies
5107	Other premium pay	5148	Laundry expenses
5108	Annual, sick and military leave	5153 1	MTMC overtime differential
5109	Indoctrination and training	5153 2	MTMC terminal demurrage
5110	Awaiting assignment	5153 3	MYMC other terminal services
5111 1	Indigenous labor, direct hire	5153 4	Other non-MTMC port expenses
5111 7	Indigenous labor, indirect hire	5167	Repairs to material in store
5112	Health benefits contributions (employer's)	5169	Loss on material by disposal
5113	Retirement contributions (employer's)	5170	Loss or gain on material by price adjustment
5114	Life insurance contributions (employer's)	5199 1	Motion Pictures
5115	Social security taxes (employer's)	5199 2	Electronic equipment
Subsistence		5199 3	Electronic equipment repairs
5121	Crew	5199 4	United Seamen's Service fees
5123	Non-crew, cabin mess	5199 5	Beneficial suggestions and awards
5125	Enlisted Subsistence	5199 6	Miscellaneous
Fuel		NON-OPERATING COSTS	
5126	Propulsion fuel	5106	Crew overtime
Equipment		5122	Non-crew subsistence
5171	Ships equipment	5127	Other premium pay
Maintenance and repair		5131	Supplies
5180 1	Overhaul	5172	Equipment
5180 2	Drydock	5183	Accident and damage repairs
5180 3	Voyage repairs	5189	Alterations
5180 4	Premium pay	5195	Activation
5180 5	Crew overtime	5196	Inactivation
5180 6	Supplies	5197	Miscellaneous
5182	Accident and damage repairs		
5185	Alterations, unprogrammed		
5186	Alterations, programmed		
5192	Extraordinary repairs		

TABLE 25
JMC NON-MANPOWER O&S
COST ANALYSIS
TAF-58, TAO-105, TATF-158

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Table 26

NON-MANPOWER OPERATING COSTS OF SELECTED
FLEET SUPPORT SHIPS
(Fiscal Year 1977)

Item	TAF (FICEL)	TAO (MISPELLION)	TATF (MOSORELEA)
A. Variable Items			
Subsistence: 1/	\$147,766	\$131,769	\$ 29,356
Variable Supplies & Services 2/	163,067	\$114,022	69,833
TOTAL	\$310,833	\$245,791	\$119,239
Variable Items as a Percentage of All Items:	91.4	13.5%	7.8%
Average Percentage-----	10.14		
B. Non-Variable Items			
Non-Variable Supplies & Services:	94,380	73,647	46,236
Fuel:	\$1,139,082	\$1,524,757	\$106,543
Ship's Equipment:	44,949	33,134	14,504
Maintenance & Repair:	1,263,040	1,264,169	609,665
Alterations:	212,360	515,763	439,703
Extraordinary Repairs:	67,743	21,765	130,625
Accident & Damage Repairs:	117,000	35,000	14,000
Miscellaneous: 3/	21,208	40,440	4,308
TOTAL	\$2,990,262	\$3,506,575	\$1,415,354
C. Totals			
Total Variable and Non-Variable Items:	\$3,291,115	\$4,054,466	\$1,534,623
Total Manpower and Non-Manpower Costs:	5,835,750	7,172,408	2,413,542
Non-Manpower Costs as a Percentage of Total Costs:	56.4%	56.5%	63.6%

1/Crew subsistence, non-crew cabin mess

2/Repairman travel, cash in lieu of subsistence, consumable supplies, medical-dental expense, transport and handling of supplies and laundry.

3/Non-crew subsistence, enlisted subsistence, reimbursable alterations.

Source: Military Sealift Command Nuclear Ship Expense Reports, Fiscal Year '77.

TABLE 26
JMC NON-MANPOWER O&S
COST ANALYSIS
COMMERCIAL CONTRACT
OPTION

Table 17-3
SCHEDULE OF OPERATING COSTS OF FLIGHT SUPPORT SHIPS
MAINTAINED BY CIVIL SERVICE AND COMMERCIAL CONTRACT CREWS
(Fiscal Year 1979 Costs Expressed in Thousands of Fiscal Year 1979 Dollars)

Ship Data	Civil Service Manning				Commercial Contract Manning	
	Total ^{1/} Operating Costs	Total ^{2/} Non-Manpower Operating Costs	Variable ^{3/} Non-Manpower Operating Costs	Non-variable ^{4/} Costs Net	Variable ^{5/} Non-Manpower Operating Costs	Total ^{2/} Non-Manpower Operating Costs
AF 1	\$ 6,800	\$ 3,849	\$ 355	\$ 3,464	\$ 327	\$ 3,791
ARE 3	37,559	59,502	5,950	53,553	5,055	58,611
AOB 3	100,234	75,167	7,517	67,650	6,200	74,040
AOF 1	54,130	33,590	3,359	30,231	2,555	33,066
AE 13	142,977	97,356	9,725	87,630	8,267	95,797
AO 16	145,643	101,697	10,170	91,527	8,645	100,172
AD 9	239,356	89,153	8,915	80,238	7,575	87,816
AS 12	296,357	114,377	11,406	102,669	9,697	112,366
AR 1	94,294	61,486	6,149	55,337	5,227	60,564
ARG 6	26,246	20,648	2,065	18,583	1,755	20,338
ASR 6	43,449	31,257	3,126	28,131	2,557	30,788
ATF 7	16,510	12,226	1,223	11,003	1,040	12,043
ATC 3	7,342	4,027	403	3,624	343	3,967
TOTALS	\$1,431,593	\$753,990	\$70,390	683,540	\$ 59,537	\$693,179

NOTES:

1/Data from CDMAN Vol. III, Appendix B, pp. B-37 - B-50 on budget costs in that section were adjusted to reflect economic costs of manpower used in CDMAN, Appendix A.

2/Total Operating Costs less Manpower Operating costs claimed by CDMAN, Vol. III, Appendix A, pp. A-107 - A-155.

3/Variable Non-Manpower Operating Costs are 10% of Total Non-Manpower Operating Costs. See Table 16.

4/Total Non-Manpower Operating Costs minus Variable Non-Manpower Operating Costs. These non-variable costs apply to both options.

5/Variable Non-Manpower Operating Costs for the Commercial Contract Option are 85% of Variable Non-Manpower Operating Costs for the Civil Service Option, because of a crew reduction of 15%. See text, p. 52.

6/Net plus Variable Non-Manpower Operating Costs for the Commercial Contract Option.

The methodology in the JMC study utilized the Nucleus Ship Expense Reports to derive the non-manpower O&S costs. It consists of two parts: the derivation of these costs for the TAF-58, TATF-158, and TAO-105 as shown in JMC Table 16; and the subsequent derivation of projected operating costs for all fleet support ships (including also the TAF, TATF and TAO classes) in JMC Table 17-B (column 2). The results of JMC Table 16 are shown below in Table 27, column A, and the subsequent derivation of each ship class cost in JMC Table 17-B are shown below in Table 27, column B. These JMC tables are reproduced in Tables 25 and 26 of this report. It is noted that there is a difference in the costs for the same ship classes between JMC Tables 16 and 17-B.

JMC Table 16 provides the detailed analysis based on the following factors. Firstly, the cost of shore utilities apparently was not included in the analysis. Secondly, the 5% MSC overhead apparently was not included in the analysis. Thirdly, overhaul costs were not annualized. The 1977 expenditures for these items are contained in the categories "maintenance and repair," "alternations," "extraordinary repairs," "accident and damage repairs," and "miscellaneous" in the Nucleus Ship Expense Reports and JMC Table 16 which is based upon those categories.

This study analyzed the costs in JMC Table 16 by making the following adjustments. Shore utilities and MSC overhead were included, and overhaul was annualized by obtaining the costs for 1977 and 1978 and averaging them in terms of 1977 dollars, since MSC utilizes a two year overhaul cycle.

The results of this analysis are shown in table 27 column C. Also shown in table 27, column D are the costs for the TAF-58, TAO-177, and TATF-166 derived from the MSC estimates provided for CIVMAN. Since the objective of CIVMAN was to project future costs, planning estimates were used for ships to be operated after 1977. Since, the TAO-177 and TATF-166 are not in service at this time, planning estimates are all that can be used. The older classes of TAOs and TATFs were not in the CIVMAN study, and hence no planning estimates were made.

TABLE 27
NON-MANPOWER O&S COST
NAVY CIVIL SERVICE MANNING
(FY 77 \$000)

	A	B	C	D
TAF-58	\$3,291	\$3,849	\$2,937	\$2,553
TAC-177	-	-	-	\$2,816
TAC-105	\$4,054	\$6,356	\$3,998	-
TATF-166	-	-	-	\$1,154
TATF-158	\$1,534	\$1,747	\$1,369	-

A - Non-manpower O&S cost derived in Table 16 (JMC Study).

B - Non-manpower O&S cost derived in Table 17-B (JMC Study).

C - CIV77 analysis of JMC Table 16. Annualizes overhaul, includes shore utilities and MSC overhead.

D - CIV77 analysis of ships to be operated in future. Utilize MSC projected non-manpower O&S costs developed for CIVMAN on TAF-58, TAO-177 and TATF-166.

X. COMMERCIAL CONTRACT NON-MANPOWER O&S COST

The JMC commercial contract non-manpower O&S costs were derived from the Civil Service costs reported in JMC Table 17-B by reducing them for the crew size ratio developed in JMC Table 16. The methodology used to obtain these costs separated the non-manpower costs for each ship into those costs which varied with crew size when commercial crews are used instead of Civil Service crews and those which did not vary with crew size. The non-variable costs are common to both civilian manning options. The Civil Service costs which varied with crew size were multiplied by the ratio of the commercial contract crew to the civil service crew to obtain the commercial contract variable cost. This adjusted variable cost was added to the non-variable cost to obtain the commercial contract non-manpower O&S cost, which is reported in the right hand column of JMC Table 17-B for each of the 13 ship types.

This analysis is concerned with the TAF, TATF and TAO classes only, and used the same two data sources for those ships as in the civil service option described above. The AF, ATF and AO costs in JMC table 17-B were analyzed by determining the expenses that vary with crew size, estimating the change in crew size from commercial contract to Civil Service manning and applying this ratio to the variable costs in a manner analogous to the JMC methodology. Once this step was completed, the result was adjusted for contractor overhead and profit as well as MSC overhead in accordance with both methods mentioned in the commercial contract manpower cost section.

Added to the non-manpower cost was the maximum \$200 per day contractor fee as discussed in section VI. This fee amounts to \$73,000 for the TAF, \$63,875 for the TAO, and \$54,750 for the TATF.

JMC Table 16 states that the "subsistence" and "variable supplies and services" categories on MSC Nucleus Ship Expense Reports vary with crew size. MSC states that the "variable supplies and services" category also includes United Seamen's Service fees, beneficial suggestions and awards, and miscellaneous supplies and services (account numbers 51994, 51995, and 51996) plus subsistence cash, consumable supplies, medical-dental expense, transport, and handling of supplies plus laundry. These three additional categories represent less than 1% of the "total variable and non-variable expenses" and equal \$16,000 for the TAF-58, \$12,000 for the TATF-158, and \$10,000 for the TAO-105. The calculations in the analysis below reflect all of the items shown as variable in Table 28. It is also noted that "subsistence" includes "noncrew cabin mess" expenses which do not vary with crew size. This item never exceeds \$2000, and thus was also too small to appreciably affect the results.

The items which vary with crew size are determined for each ship in JMC Table 16 and average 10.1%. This study developed an analogous set of percentages by taking the ratio of the variable items shown in Table 28 and dividing it by the sum of all non-manpower O&S costs from the Nucleus Ship Expense Reports plus shore utilities. These ratios are shown in Table 29.

TABLE 28
MSC NUCLEUS SHIP EXPENSE ACCOUNT NUMBERS
AND TITLES FOR SUPPLIES AND SERVICES

<u>Account Number</u>	<u>Account Title</u>
<u>Supplies and services</u>	
5116	Travel
5117	Repatriation travel
5120	Cash in lieu of subsistence and quarters
5130	Consumable supplies
5136	Medical and dental expenses
5138	Transportation and handling of supplies
5148	Laundry Expenses
*5153 1	MTMC overtime differential
*5153 2	MTMC terminal demurrage
*5153 3	MTMC other terminal services
*5153 4	Other non-MTMC port expenses
*5167	Repairs to material in store
*5169	Loss on material by disposal
*5170	Loss or gain on material by price adjustment
*5199 1	Motion pictures
*5199 2	Electronic equipment
*5199 3	Electronic equipment repairs
5199 4	United Seamen's Service fees
5911 5	Beneficial suggestions and awards
5199 6	Miscellaneous

*Items which do not vary with crew size

TABLE 29
NSER VARIABLE ITEMS AS PERCENTAGE OF ALL NUCLEUS
SHIP EXPENSE REPORT ITEMS PLUS SHORE UTILITIES

AF-58	11.3%
AO-177*	14.6%
AO-105	14.6
ATF-166**	9.9%
ATF-158	9.9%

*Assumed to be the same as AO-105
**Assumed to be the same as ATF-158

The ratios in Table 29 are needed to estimate the percentage of variable expenses for the TAO-177 and TATF-166, since no Nucleus Ship Expense Reports exist for them. It was assumed that the percentage of variable expenses for these two ships was equal to that for the TAO-105 and TATF-158, respectively.

To convert Civil Service variable cost to commercial contract variable cost, the crew reduction ratio was multiplied by the Civil Service variable cost. These crew reduction ratios are shown in Table 30, and it is noted that the military detachments on each ship listed in Section II, Table 1, are included in the crew for each manning option to derive this ratio.

At this point, the calculations can be compared to those in the JMC Tables 16 and 17-B. These costs include no contractor G&A or profit, nor MSC agency overhead. The comparisons are shown in Table 31.

The final step in this analysis is to account for profit and overhead. The particulars of these calculations are discussed in Section VI. The final results of the 10% contractor G&A and 15% profit method are shown in Table 32, the final results of the \$200 per day maximum fee are shown in Table 33. In both of these tables, the JMC estimates are presented in column A. The CIV77 analysis of these estimates, reflecting the profit and overhead cost in that option, is presented in column B. Columns C and D reflect the CIV77 estimate of the JMC ship classes and the CIVMAN ship classes.

TABLE 30
COMMERCIAL CONTRACT TO CIVIL SERVICE CREW RATIO

AF-58	93.7%
AO-177	95.4%
AO-105	81.7%
ATF-166	175%
ATF-158	88.2%

TABLE 31
COMPARISON OF JMC TABLES 16 AND 17B
CALCULATIONS - NON-MANPOWER O&S COST
(FY 77 \$000)

	A	B	C	D
TAF-58	\$3,246	3,791	2,778	2,450
TAO-177	-	-	-	2,675
TAO-105	3,973	6,261	3,704	-
TATF-166	-	-	-	1,183
TATF-158	1,516	1,720	1,303	-

- A - JMC non-manpower O&S costs from the JMC Table 16. The variable items cost in Table 16 were reduced by the 85% crew reduction ratio reported in JMC Table 17-B, footnote 5.
- B - JMC non-manpower O&S costs from JMC Table 17-B, right hand column.
- C - CIV77 analysis of JMC Table 16. Reduces variable expenses by ratio from Table 30 above and include annualization of overhaul and shore utilities.
- D - CIV77 analysis of ships to be operated in future. Utilizes MSC projected non-manpower O&S costs developed from CIVMAN on TAF-58, TAO-177, and TATF-166.

TABLE 32
COMMERCIAL CONTRACT
NON-MANPOWER O&S COST
10% G&A EXPENSES/15% PROFIT METHOD
(FY 77 \$000)

	A	B	C	D
TAF-58	3,791	4,987	3,655	3,223
TAC-177	-	-	-	3,519
TAO-105	6,261	8,237	4,873	-
TATF-166	-	-	-	1,513
TATF-158	1,720	2,263	1,714	-

- A - JMC non-manpower O&S cost derived in Table 17-B, right hand column.
- B - JMC Table 17-B, right hand column plus 10% G&A, 15% profit, and 4% MSC overhead.
- C - CIV77 analysis of TAF-58, TAO-105, and TATF-158 from Nucleus Ship Expense Reports: annualizes overhaul, includes shore utilities, adds 10% G&A, 15% profit, and 4% MSC overhead.
- D - CIV77 analysis of TAF-58, TAO-177, and TATF-166 based on MSC projected non-manpower O&S costs developed for CIVMAN. Includes 10% G&A, 15% profit, and 4% MSC overhead.

TABLE 33
COMMERCIAL CONTRACT
NON-MANPOWER O&S COST
\$200 PER DAY MAXIMUM FEE METHOD
(FY 77 \$000)

	A	B	C	D
TAF-58	3,791	4,019	2,965	2,624
TAC-177	-	-	-	2,849
TAO-105	6,261	6,578	3,919	-
TATF-166	-	-	-	1,253
TATF-158	1,720	1,846	1,412	-

A - JMC non-manpower O&S cost derived in Table 17-B, right hand column.

B - JMC Table 17-B, right hand column plus fixed contractor fee and 4% MSC overhead.

C - CIV77 analysis of TAF-58, TAC-105, and TATF-158 from Nucleus Ship Expense Reports: annualizes overhaul, includes shore utilities, adds fixed contractor fee and 4% MSC overhead.

D - CIV77 analysis of TAF-53, TAO-177 and TATF-166 based on MSC projected non-manpower O&S costs developed for CIVMAN. Adds fixed contractor fee and 4% MSC overhead.

XI. TOTAL COST COMPARISON

The total costs of the two civilian options are shown in Tables 34, 35, and 36. The comparisons of Civil Service and commercial contract total costs for the three cost analyses detailed in this study are shown in table 37. The greater cost of commercial operation of each ship in question is shown in the CIV77 and JMC Data/CIV77 methodology results. The commercial costs shown under these options are priced under the \$200 per day maximum general agency fee method. If the 10% G&A/15% profit method had been applied, the commercial cost would have risen substantially.

These results do not corroborate the JMC study claim of cost savings under commercial operation.

The total costs for Navy military operation (Table 38) indicated that though there may be some reason to believe that Navy military manpower may cost less than civilian manpower, the overall cost of Navy military operation exceeds that of Navy Civil Service operation.

TABLE 34
TOTAL COST CIVIL SERVICE MANNING
(FY 77 \$000)

	A	B	C	D	E	F
TAF-58	8,118	8,676	6,957	6,413	6,797	6,266
TAC-177	-	-	-	5,815	-	-
TAC-105	9,428	11,730	8,229	-	7,725	7,871
TATF-166	-	-	-	1,817	-	-
TATF-158	3,165	3,378	2,640	-	2,520	2,458

- A - JMC manpower cost from CIV77 Table 10, column A, plus JMC non-manpower O&S cost from CIV77 Table 27 column A (JMC Table 16).
- B - JMC manpower cost from CIV77 Table 10, column A, plus JMC non-manpower O&S cost from CIV-77 Table 27 column B (JMC table 17-B).
- C - CIV77 analysis of JMC data. CIV77 manpower cost from CIV77 Table 10, column B, plus CIV77 non-manpower O&S cost from CIV77 table 27 column C.
- D - CIV77 analysis of MSC planning data. CIV77 Table 10, column C, plus CIV77 table 27 column D, for TAF-53, TAO-177, TATF-166
- E - CIV77 analysis of MSC manpower planning data and MSC operational non-manpower costs for TAF-58, TAO-105 and TATF-158. CIV77 Table 10, column C, plus CIV77 table 27 column C, for the designated ships.
- F - CIV77 analysis of MSC Nucleus Ship Expense Reports (actual cost records) with adjustments for OMB Circular A-76. CIV77 Table 10, column D, plus CIV77 table 27 column C.

TABLE 35
TOTAL COST COMMERCIAL CONTRACT MANNING
\$200 PER DAY MAXIMUM METHOD (FY 77 \$000)

	A	B	C	D	E
AF-58	7,303	7,671	7,213	6,872	7,270
AO-177	-	-	-	6,782	-
AC-105	10,251	10,728	7,997	-	8,408
ATF-166	-	-	-	2,623	-
ATF-158	2,866	3,038	2,652	-	2,808

- A - JMC manpower cost from backup sheets plus MILDET from JMC Table 14, plus JMC non-manpower O&S costs from JMC Table 17-B.
- B - Column A plus General Agency Fee and 4% MSC overhead.
- C - CIV77 analysis of MarAd manpower data for CIVMAN plus CIV77 analysis of TAF-58, TAO-105, and TATF-158 from Nucleus Ship Expense Reports: analyzes overhaul, includes shore utilities, add fixed contractor fee, and add 4% MSC overhead.
- D - CIV77 analysis of MarAd manpower data from CIVMAN plus CIV77 analysis of TAF-58, TAO-177, and TATF-166, based on MSC projected non-manpower O&S costs for CIVMAN. Adds fixed contractor fee and 4% MSC overhead. CIV77 Table 13 column C plus CIV77 Table 33 column D.
- E. CIV77 analysis of MarAd data provided for JMC. CIV77 table 33 column C plus table 13 column D.

TABLE 36
TOTAL COST COMMERCIAL CONTRACT MANNING
10% G&A/15% PROFIT METHOD (FY-77 \$000)

	A	B	C	D	E
AF-58	7,303	9,607	9,028	8,596	9,100
AO-177	-	-	-	8,494	-
AO-105	10,251	13,486	10,032	-	10,551
ATF-166	-	-	-	3,246	-
ATF-158	2,866	3,771	3,283	-	3,480

A - JMC cost derived from JMC backup tables plus MILDET cost per ship from JMC Table 14, plus JMC non-manpower O&S cost derived in Table 17-B.

B - Column A, plus 10% G&A, 15% profit, 4% MSC overhead.

C - CIV77 analysis of MarAd manpower data for CIVMAN plus CIV77 analysis of TAF-58, TAO-105, and TATF-158 from Nucleus Ship Expense Reports. Table 32, column C, plus Table 14, column C.

D - CIV77 analysis of MarAd manpower data from CIVMAN plus CIV77 analysis of TAF-58, TAO-177, and TATF-166. Table 32, column D plus Table 14 column C.

E - CIV77 analysis of MarAd data provided for JMC. Table 32, column C, plus Table 14 column D.

TABLE 37
CIVIL SERVICE vs. COMMERCIAL CONTRACT TOTAL
COST COMPARISON
(FY 77 \$000)

	JMC		JMC DATA/ CIV77 METHOD		CIV77	
	A	B	C	D	E	F
AF-58	8,118	7,303	6,957	7,270	6,797	7,213
AO-177	-	-	-	-	5,315	6,782
AO-105	9,428	10,251	8,229	8,408	7,725	7,997
ATF-166	-	-	-	-	1,817	2,623
ATF-158	3,165	2,866	2,640	2,808	2,529	2,652

A - JMC Civil Service Cost Table 34, column A

B - JMC Commercial Contract Cost Table 35, column A

C - JMC Data/CIV77 Method Civil Service Cost Table 34, column C

D - JMC Data/CIV77 Method Commercial Contract Cost Table 35,
column E

E - CIV77 Civil Service Cost Table 34, column D and E with
precedence for E

F - CIV77 Commercial Contract Cost Table 35, column C and D with
precedence for C

TABLE 38
TOTAL NAVY MILITARY COST
(FY 77 \$000)

AF-58	7,084
AO-177	9,051
AO-105	10,549
ATF-166	2,462
ATF-158	3,043

REFERENCES

- 1) Information Spectrum, Inc., Investigation of the Potential for Increased Use of Civilian Manning in Fleet Support Ships, Systems Analysis Division (OP-96), Office of the Chief of Naval Operations, 21 March, 1978.
- 2) Office of the Chief of Naval Operations (OP-90P), Navy Program Factors Manual, Volume I, revision, 27 July, 1976.
- 3) Military Sealift Command, MSC Ship Expense Vs. Budget Variance Reports, FY 77 and FY 78.
- 4) Ruttenberg, Friedman, Kilgallon, Gutchess and Associates, Inc., Draft Report of "Civilianization of Navy Fleet Support Ships," March 1980
- 5) Joint Maritime Congress, letter to I.N. Blickstein, OP-964C, dated 22 October 1980.
- 6) U.S. Office of Management and Budget, Circular A-76, March 29, 1979.
- 7) U.S. Maritime Administration/Military Sealift Command, Civilian Seafaring Manpower Requirements in Peace and War, 1978 - 1984, November 16, 1978.

APPENDIX

TABLE A-1 AF-58 NAVY MANPOWER REQUIREMENTS SUMMARY¹

TYPE SHIP: Stores

REPRESENTATIVE SHIP STUDIED: AF-58

DIVISION	MANPOWER REQUIREMENTS			
	OFFICERS	WARRANT OFFICERS	ENLISTED	TOTAL ALL GRADES
DECK	6	0	109	115
ENGINE	2	2	76	80
STEWARD	0	0	0	0
PURSER	2	1	43	46
MEDICAL	0	0	0	0
COMMUNI- CATIONS	1	0	8	9
REPAIR	0	0	0	0
ALL DIVISIONS	11	3	236	250

¹No ships of this class are presently in service with a Navy military crew. No SMD was available and therefore the Manpower Authorization document, OPNAV Form 1000/2A(2-68) was used. The allowance column of this document dated 9/22/71, is the basis for the numbers and skills of the Navy military crew.

TABLE A-2 AO-177 NAVY MANPOWER REQUIREMENTS SUMMARY¹TYPE SHIP: Replenishment OilerREPRESENTATIVE SHIP STUDIED: AO-177

DIVISION	MANPOWER REQUIREMENTS			
	OFFICERS	WARRANT OFFICERS	ENLISTED	TOTAL ALL GRADES
DECK	5	1	78	84
ENGINE	2	1	65	68
STEWARD	0	0	16	16
PURSER	2	0	19	21
MEDICAL	0	0	1	1
COMMUNI- CATIONS	1	0	7	8
REPAIR	0	0	0	0
ALL DIVISIONS	10	2	186	198

¹

Since this ship class is being constructed, the Preliminary ship Manning Document (PSMD) is undergoing constant revision. The PSMD, dated 18 January 1980, used in this analysis is the latest approved manpower allocation for the lead ship. Navy manpower planners advise that follow-on ships of this class could have changes in numbers of personnel and skill levels.

TABLE A-3 AO-105 NAVY MANPOWER REQUIREMENTS SUMMARY

TYPE SHIP: Replenishment Oiler

REPRESENTATIVE SHIP STUDIED: AO-105

DIVISION	MANPOWER REQUIREMENTS			
	OFFICERS	WARRANT OFFICERS	ENLISTED	TOTAL ALL GRADES
DECK	6	1	124	131
ENGINE	3	1	104	108
STEWARD	0	0	21	21
PURSER	2	0	21	23
MEDICAL	1	0	3	4
COMMUNI- CATIONS	1	0	11	12
REPAIR	0	0	0	0
ALL DIVISIONS	13	2	284	299

TABLE A-4 ATF-166 NAVY MANPOWER REQUIREMENTS SUMMARY¹TYPE SHIP: TowingREPRESENTATIVE SHIP STUDIED: ATF-166

DIVISION	MANPOWER REQUIREMENTS			
	OFFICERS	WARRANT OFFICERS	ENLISTED	TOTAL ALL GRADES
DECK	2	1	11	14
ENGINE	0	1	16	17
STEWARD	0	0	0	0
PURSER	0	0	6	6
MEDICAL	0	0	0	0
COMMUNI- CATIONS	0	0	10	10
REPAIR	0	0	0	0
ALL DIVISIONS	2	2	43	47

¹This new class of ocean-going tug and salvage ship is more properly identified as TATF-166 since it was designed and built to be manned by a Navy Civil Service crew. Accommodations for 20 regular crew members and "troop" type accommodations for a transient salvage and diving detachment of 20 men are provided. Space and weight reservations have been made to billet 16 additional men to allow conversion to Navy military manning should that be necessary. For purposes of this analysis a "constructed" SMD adhering to the manning philosophy numbers and skill levels found on other fleet tugs was developed.

TABLE A-5 ATF-158 NAVY MANPOWER REQUIREMENTS SUMMARY

TYPE SHIP: Towing & SalvageREPRESENTATIVE SHIP STUDIED: ATF-158

DIVISION	MANPOWER REQUIREMENTS			
	OFFICERS	WARRANT OFFICERS	ENLISTED	TOTAL ALL GRADES
DECK	4	0	41	45
ENGINE	0	1	32	33
STEWARD	0	0	10	10
PURSER	0	0	4	4
MEDICAL	0	0	0	0
COMMUNI- CATIONS	1	0	4	5
REPAIR	0	0	0	0
ALL DIVISIONS	5	1	91	97

TABLE A-6 TAF-58 CIVIL SERVICE MANPOWER REQUIREMENTS SUMMARY
(CIVILIAN SEAMEN/NAVY MILITARY DETACHMENT*)

TYPE SHIP: Stores

REPRESENTATIVE SHIP STUDIED: TAF-58

DIVISION	MANPOWER REQUIREMENTS		
	LICENSED	UNLICENSED	TOTAL
DECK	8/1*	46/1*	54/2*
ENGINE	7/0	29/0	36/0
STEWARD	0/0	23/0	23/0
PURSER	0/0	2/3*	2/3*
MEDICAL	0/0	1/0	1/0
COMMUNI- CATIONS	0/0	0/13*	0/13*
REPAIR	0	0	0
ALL DIVISIONS	15/1*	101/17*	116/18*

*Denotes MILDET members

TABLE A-7 TAO-177 CIVIL SERVICE MANPOWER REQUIREMENTS SUMMARY
(CIVILIAN SEAMEN/NAVY MILITARY DETACHMENT*)

TYPE SHIP: Replenishment Oiler

REPRESENTATIVE SHIP STUDIED: TAO-177

DIVISION	MANPOWER REQUIREMENTS		
	LICENSED	UNLICENSED	TOTAL
DECK	6/1*	31/1*	37/2*
ENGINE	5/0	17/0	22/0
STEWARD	0/0	22/0	22/0
PURSER	0/0	7/1*	7/1*
MEDICAL	0/0	1/0	1/0
COMMUNI- CATIONS	0	0/16*	0/16*
REPAIR	0	0	0
ALL DIVISIONS	11/1*	78/18*	89/19*

*Denotes MILDET members

TABLE A-8 TAO-105 CIVIL SERVICE MANPOWER REQUIREMENTS SUMMARY
(CIVILIAN SEAMEN/NAVY MILITARY DETACHMENT*)

TYPE SHIP: Replenishment Oiler

REPRESENTATIVE SHIP STUDIED: TAO-105

DIVISION	MANPOWER REQUIREMENTS		
	LICENSED	UNLICENSED	TOTAL
DECK	6/0	34/0	40/0
ENGINE	10/0	28/0	38/0
STEWARD	0/0	23/0	23/0
PURSER	0/0	3/0	3/0
MEDICAL	0/0	1/0	1/0
COMMUNI- CATIONS	0/1*	0/15*	0/16*
REPAIR	0	0	0
ALL DIVISIONS	16/1*	89/15*	105/16*

*Denotes MILDET members

TABLE A-9 TATF-166 CIVIL SERVICE MANPOWER REQUIREMENTS SUMMARY
(CIVILIAN SEAMEN/NAVY MILITARY DETACHMENT*)

TYPE SHIP: Towing

REPRESENTATIVE SHIP STUDIED: TATF-166

DIVISION	MANPOWER REQUIREMENTS		
	LICENSED	UNLICENSED	TOTAL
DECK	3/0	6/0	9/0
ENGINE	1/0	2/0	3/0
STEWARD	0	4/0	4/0
PURSER	0	0	0
MEDICAL	0	0	0
COMMUNI- CATIONS	0	0/4*	0/4*
REPAIR	0	0	0
ALL DIVISIONS	4/0	12/4*	16/4*

*Denotes MILDET members

TAFIE A-10 TATF-158 CIVIL SERVICE MANPOWER REQUIREMENTS SUMMARY
(CIVILIAN SEAMEN/NAVY MILITARY DETACHMENT*)

TYPE SHIP: Towing & Salvage

REPRESENTATIVE SHIP STUDIED: TATF-158

DIVISION	MANPOWER REQUIREMENTS		
	LICENSED	UNLICENSED	TOTAL
DECK	4/0	7/0	11/0
ENGINE	4/0	7/0	11/0
STEWARD	0/0	4/0	4/0
PURSER	0/0	1/0	1/0
MEDICAL	0/0	0/0	0/0
COMMUNI- CATIONS	0/1*	0/5*	0/6*
REPAIR	0	0	0
ALL DIVISIONS	8/1*	19/5*	27/6*

*Denotes MILDET members

TABLE A-11 TAF-58 COMMERCIAL CONTRACT MANPOWER REQUIREMENTS SUMMARY
(CIVILIAN SEAMEN/NAVY MILITARY DETACHMENT*)

TYPE SHIP: Stores

REPRESENTATIVE SHIP STUDIED: TAF-58

DIVISION	MANPOWER REQUIREMENTS		
	LICENSED	UNLICENSED	TOTAL
DECK	5/1*	37/1*	42/2*
ENGINE	8/0	22/0	30/0
STEWARD	0	22/0	22/0
PURSER	0/1*	1/8*	1/9*
MEDICAL	0 ¹	0	0
COMMUNI- CATIONS	1/1*	0/15*	1/16*
REPAIR	0	0	0
ALL DIVISIONS	14/3*	82/24*	96/27*

*Denotes MILDET members

¹Civilian Purser is cross-trained to perform medic duties.

TABLD A-12 AO-177 COMMERCIAL CONTRACT MANPOWER REQUIREMENTS SUMMARY
(CIVILIAN SEAMEN/NAVY MILITARY DETACHMENT*)

TYPE SHIP: Replenishment Oiler

REPRESENTATIVE SHIP STUDIED: TAO-177

DIVISION	MANPOWER REQUIREMENTS		
	LICENSED	UNLICENSED	TOTAL
DECK	5/1*	30/1*	35/2*
ENGINE	7/0	19/0	26/0
STEWARD	0	21/0	21/0
PURSER	0	1/4*	1/4*
MEDICAL	0 ¹	0	0
COMMUNI- CATIONS	1/1*	0/12*	1/13*
REPAIR	0	0	0
ALL DIVISIONS	13/2*	71/17*	84/19*

*Denotes MILDET members

¹Civilian Purser is cross-trained to perform medic duties.

TABLE A-13 TAO-105 COMMERCIAL CONTRACT MANPOWER REQUIREMENTS SUMMARY
(CIVILIAN SEAMEN/NAVY MILITARY DETACHMENT*)

TYPE SHIP: Replenishment Oiler

REPRESENTATIVE SHIP STUDIED: TAO-105

DIVISION	MANPOWER REQUIREMENTS		
	LICENSED	UNLICENSED	TOTAL
DECK	5/0	30/0	35/0
ENGINE	10/0	20/0	30/0
STEWARD	0	21/0	21/0
PURSER	0/0	1/0	1/0
MEDICAL	0	0	0
COMMUNI- CATIONS	1/1*	0/15*	1/16*
REPAIR	0	0	0
ALL DIVISIONS	16 /1*	72 /15*	88/16*

*Denotes MILDET members

TABLE A-14 TATF-166 COMMERCIAL CONTRACT MANPOWER REQUIREMENTS SUMMARY
(CIVILIAN SEAMEAN/NAVY MILITARY DETACHMENT*)

TYPE SHIP: Towing

REPRESENTATIVE SHIP STUDIED: TATF-166

DIVISION	MANPOWER REQUIREMENTS		
	LICENSED	UNLICENSED	TOTAL
DECK	4 / 0	9 / 0	13 / 0
ENGINE	3 / 0	4 / 0	7 / 0
STEWARD	0	4 / 0	4 / 0
PURSER	0	0	0
MEDICAL	0 ¹	0	0
COMMUNI- CATIONS	1 / 0	0 / 10*	1 / 10*
REPAIR	0	0	0
ALL DIVISIONS	8 / 0	17 / 10*	25 / 10*

*Denotes MILDET members

¹Civilian Purser is cross-trained to perform medic duties.

TABLE A-15 TATF-158 COMMERCIAL CONTRACT MANPOWER REQUIREMENTS SUMMARY
(CIVILIAN SEAMEN/NAVY MILITARY DETACHMENT*)

TYPE SHIP: Towing & Salvage

REPRESENTATIVE SHIP STUDIED: TATF-158

DIVISION	MANPOWER REQUIREMENTS		
	LICENSED	UNLICENSED	TOTAL
DECK	3/0	7/0	10/0
ENGINE	3/0	7/0	10/0
STEWARD	0	4/0	4/0
PURSER	0	0	0
MEDICAL	0	0	0
COMMUNI- CATIONS	0/1*	0/9*	0/10*
REPAIR	0	0	0
ALL DIVISIONS	6/1*	18/9*	24/10*

*Denotes MILDET members

TABLE A-16

TAF-58 NAVY CIVIL SERVICE MANNING AND

BASE PAY¹ (FY77\$)

	BASE WAGE	TOTAL
1 Master	46,270	46,270
2 1st Officer	25,027	50,054
1 2nd Officer	17,752	17,752
2 3rd Officer	15,954	31,908
1 3rd Officer	4,085	4,085
1 Fleet Issue Officer	20,049	20,049
2 Bosun	13,237	26,474
1 Carpenter	11,946	11,946
1 Chief Yeoman Storekeeper	15,447	15,447
2 Yeoman Storkeeper	10,418	20,836
1 Yeoman Storekeeper	688	688
5 Bosun Mate	10,863	54,315
6 Able Seamen	9,116	54,696
14 Able Seamen Maintenance	10,181	142,534
11 Able Seamen Maintenance	9,508	104,588
3 Ordinary Seamen	7,117	<u>21,351</u>
Subtotal		622,993

TABLE A-16 (cont.)
TAF-58 NAVY CIVIL SERVICE MANNING AND
BASE PAY (FY77\$)

	BASE WAGE	TOTAL
1 Chief Engineer	41,764	41,764
1 1st Asst Eng	25,839	25,839
1 2nd Asst Eng	18,328	18,328
2 3rd Asst Eng	16,472	32,944
1 3rd Asst Eng	4,085	4,085
1 3rd Asst Eng	21,083	21,083
2 Deck Engineer	11,175	22,350
3 Unlic Jr. Eng	10,376	31,128
1 Electrician	14,602	14,602
3 Refrig Eng	12,235	36,705
1 Machinist	11,809	11,809
1 Yeo Stk-Eng	10,417	10,417
2 2nd Electrician	10,417	20,834
3 Engine Utilityman	10,524	31,572
3 Oiler	9,116	27,348
3 Refrig Oiler	9,116	27,348
3 Fireman Watertender	9,116	27,348
3 Wiper	8,466	25,398
1 Wiper	7,907	<u>7,907</u>
Subtotal		438,809

TABLE A-16
TAF-58 NAVY CIVIL SERVICE MANNING AND
BASE PAY (FY77\$)

	BASE WAGE	TOTAL
1 Chief Steward	13,237	13,237
1 3rd Steward	9,212	9,212
1 Chief Cook	10,645	10,645
2 Cook Baker	10,374	20,748
1 3rd Cook	9,009	9,009
6 Messman	7,067	42,402
7 Utilityman	7,067	49,469
3 Utilityman	6,600	19,800
1 3rd Pantryman	7,638	<u>7,638</u>
Subtotal		182,160
1 Purser	21,352	21,352
1 Yeoman Storekeeper	10,418	<u>10,418</u>
Subtotal		31,770
1 Nurse	14,519	<u>14,519</u>
Total Base Pay		1,290,251

¹This data was provided by MSC from their FY1977 Manning and Wage Scales.

TABLE A-17

TAF-58 NAVY CIVIL SERVICE OPERATION-TOTAL

MANPOWER COST (FY77\$)¹

Total Base Pay	1,290,251
Overtime	919,383
Premium/Penalty Pay	105,953
Subsistence	169,360
Other (Relief Officers, Awaiting Assignment, Training, Damage Control Instruction)	6,000
Retirement (20.4% of Base Pay) ²	263,211
Life & Health Insurance (3.7% of Base Pay) ²	47,739
Workmen's Compensation Bonuses & Awards, Unemployment Programs (1.9% of Base Pay) ²	24,515
Shore Leave (10.5% of Base Pay)	135,476
Annual, Sick & Military Leave	391,000
Travel	24,000
Subtotal direct and indirect manpower costs	3,376,883
MILDET	298,879
MSC Overhead (5% of \$3,675,767) ²	<u>183,788</u>
Total Manpower Cost	3,859,555

¹Data obtained from MSC Manning and Wage Scale tables and computed to include overhead costs.

²Based on OMB Circular A-76

AD-A097 167

INFORMATION SPECTRUM INC ARLINGTON VA F/G 15/5
ANALYSIS OF A STUDY ENTITLED CIVILIANIZATION OF NAVY FLEET SUPP--ETC(U)
DEC 80 A S RHODE, L DAVIS, R E OSSECK N00014-79-C-0040
ISI-V-0514-02A NL

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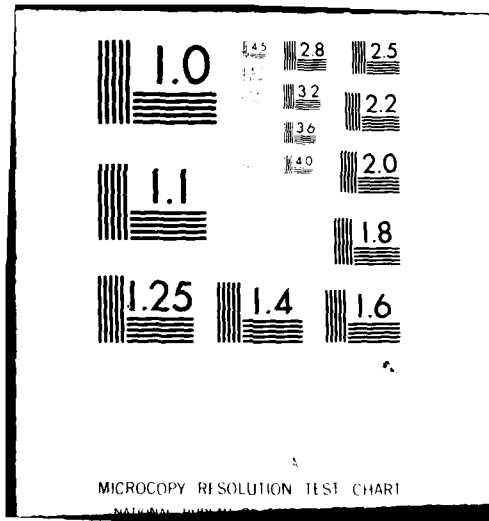


TABLE A-18
TAO-177 NAVY CIVIL SERVICE MANNING AND
BASE PAY¹ (FY77\$)

	BASE WAGE	TOTAL
1 Master	46,262	46,262
1 1st Officer	25,847	25,847
1 2nd Officer	17,855	17,855
2 3rd Officer	15,518	31,036
2 Bosun	12,322	24,644
1 Carpenter	11,372	11,372
5 Bosun Mate	10,780	53,900
6 Able Seaman	8,896	53,376
14 Able Seaman	10,110	141,540
3 Ordinary Seaman	8,167	24,501
1 Chief Officer	25,847	<u>25,847</u>
Subtotal		456,180

TABLE A-18 (cont.)

TAO-177 NAVY CIVIL SERVICE MANNING AND

BASE PAY (FY77\$)

	BASE WAGE	TOTAL
1 Chief Engineer	42,870	42,870
1 1st Asst Engineer	27,076	27,076
2 2nd Asst Engineer	23,942	47,884
1 3rd Asst Engineer	20,810	20,810
3 Unl Jr. Engr	10,007	30,021
1 Chief Electrician	14,085	14,085
3 Pumpmen	12,433	37,299
1 Refrig Eng	12,708	12,708
2 Deck Engineer - Machinist	11,390	22,780
1 2nd Electrician	12,708	12,708
3 Wiper	8,167	24,501
3 3rd Asst Eng	16,257	<u>48,771</u>
Subtotal		341,513
1 Chief Steward	12,371	12,371
1 Chief Cook	10,689	10,689
1 2nd Cook	9,256	9,256
2 3rd Cook	9,256	18,512
1 Cook Baker	9,256	9,256
5 Messman	6,815	34,075
9 Utilityman	6,815	61,335
2 Laundryman	7,186	<u>14,372</u>
Subtotal		169,866

TABLE A-18 (cont.)
TAO-177 NAVY CIVIL SERVICE MANNING AND
BASE PAY (FY77\$)

	BASE WAGE	TOTAL
1 Purser	20,113	20,113
1 Jr. Purser	15,809	15,809
3 Yeoman Storekeeper	10,049	30,147
1 Yeoman Storekeeper	10,049	10,049
1 Chief Yeoman Storekeeper	15,809	<u>15,809</u>
Subtotal		91,927
1 Nurse	13,678	<u>13,678</u>
Total Base Pay		1,073,164

^j This data was provided by MSC from their FY 1977 Manning and Wage Scales.

TABLE A-19

TAO-177 NAVY CIVIL SERVICE OPERATION-TOTAL
MANPOWER COST¹ (FY77\$)

Total Base Pay	1,073,164
Overtime	633,024
Premium/Penalty Pay	64,405
Subsistence	110,856
Other (Relief Officers, Awaiting Assignment, Training, Damage Control Instruction)	64,050
Retirement (20.4% of Base Pay) ²	218,925
Life & Health Insurance (3.7% of Base Pay) ²	39,707
Workman's Compensation, Bonuses & Awards, Unemployment Programs (1.9% of Base Pay) ²	20,390
Shore Leave (10.5% of Base Pay)	112,682
Annual, Sick & Military Leave	198,450
Travel	<u>2,100</u>
Subtotal direct and indirect manpower costs	2,537,753
MILDET	318,546
MSC overhead (5% of \$2,856,299) ²	<u>142,815</u>
Total Manpower Cost	2,999,114

¹Data obtained from MSC Manning and Wage Scale tables and computed to include overhead costs.

²Based on OMB Circular A-76

TABLE A-20
TAO-105 NAVY CIVIL SERVICE MANNING AND
BASE PAY¹ (FY77\$)

	BASE WAGE	TOTAL
1 Master	47,089	47,089
2 1st Officer	27,191	54,382
1 2nd Officer	18,785	18,785
2 3rd Officer	16,325	32,650
2 Bosun	12,294	24,588
1 Carpenter	11,790	11,790
1 Chief Yeoman Storekeeper	16,540	16,540
1 Yeoman Storekeeper	10,418	10,418
5 Bosun Mate	10,863	54,315
6 Able Seaman	9,223	55,338
14 Able Seaman Maintenance	10,482	146,748
3 Ordinary Seaman	7,309	21,927
1 Ordinary Seaman	8,467	<u>8,467</u>
Subtotal		503,037

TABLE A-20 (cont.)
TAO-105 NAVY CIVIL SERVICE MANNING AND
BASE PAY (FY77\$)

	BASE WAGE	TOTAL
1 Chief Engineer	44,444	44,444
1 1st Asst Engr	21,932	21,932
1 2nd Asst Engr	19,393	19,393
1 2nd Asst Engr	24,825	24,825
5 3rd Asst Engr	16,854	84,270
1 3rd Asst Engr	21,577	21,577
3 Unlic Jr. Engr	10,376	31,128
1 Electrician	14,098	14,098
3 Pumpman	12,892	38,676
1 Refrig Eng	13,178	13,178
2 Deck Eng Machinist	11,809	23,618
1 Yeoman Storekeeper	10,418	10,418
2 2nd Electrician	13,174	26,348
3 Eng Utilitymen	10,524	31,572
3 Oiler	9,223	27,669
3 Fireman Watertender	9,223	27,669
6 Wiper	8,465	<u>50,790</u>
Subtotal		511,605

TABLE A-20 (cont.)

TAO-105 NAVY CIVIL SERVICE MANNING AND

BASE PAY (FY77\$)

	BASE WAGE	TOTAL
1 Chief Steward	12,346	12,346
1 Chief Cook	11,081	11,081
1 Yeoman Storekeeper	10,418	10,418
2 Cook Baker	10,374	20,748
2 Asst Cook	9,595	19,190
5 Messman	7,067	35,335
8 Utilitymen	7,067	56,536
1 3rd Pantryman	7,638	7,638
2 Laundryman	7,450	<u>14,900</u>
Subtotal		188,192
1 Purser	21,352	21,352
1 Jr Purser	16,782	16,782
1 Yeoman Storekeeper	10,418	<u>10,418</u>
Subtotal		48,552
1 Nurse	14,519	<u>14,519</u>
Total Base Pay		1,265,905

¹This data was provided by MSC from their FY 1977 Manning and Wage Scales.

TABLE A-21

TAO-105 NAVY CIVIL SERVICE OPERATION-TOTAL

MANPOWER COST¹ (FY77\$)

Total Base Pay	1,265,905
Overtime	940,560
Premium/Penalty Pay	94,023
Subsistence	153,300
Other (Relief Officers, Awaiting Assignment, Training, Damage Control Instruction)	61,000
Retirement (20.4% of Base Pay) ²	258,245
Life & Health Insurance (3.7% of Base Pay) ²	46,838
Workmen's Compensation, Bonuses & Awards, Unemployment Programs (1.9% of Base Pay) ²	24,052
Shore Leave (10.5% of Base Pay)	132,920
Annual Sick & Military Leave	247,000
Travel	<u>93,000</u>
Subtotal Direct and Indirect Manpower Costs	3,316,843
MILDET	232,516
MSC Overhead (5% of \$3,549,359) ²	<u>177,469</u>
Total Manpower Cost	3,726,827

¹Data obtained from MSC Manning and Wage Scale tables and computed to include overhead costs.

²Based on OMB Circular A-76

TABLE A-22
TATF-166 NAVY CIVIL SERVICE MANNING AND
BASE PAY¹ (FY77\$)

	BASE WAGE	TOTAL
1 Master	33,063	33,063
1 1st Officer	17,810	17,810
1 2nd Officer	16,066	16,066
6 Able Seamen	9,674	<u>58,044</u>
Subtotal		124,983
1 Chief Engineer	39,402	39,402
2 QMED	12,225	<u>24,450</u>
Subtotal		63,852
1 Steward-Cook	11,839	11,839
1 Cook-Baker	11,007	11,007
2 Utilityman	7,496	<u>14,992</u>
Subtotal		37,838
Total Base Pay		226,673

¹This data was provided by MSC from their FY 1977 Manning and Wage Scales.

TABLE A-23

TATF-166 NAVY CIVIL SERVICE OPERATION-TOTAL

MANPOWER COST¹ (FY77\$)

Total Base Pay	226,673
Overtime	162,182
Premium/Penalty Pay	17,891
Subsistence	19,929
Other (Relief Officers, Awaiting Assignment, Damage Control Instruction)	8,400
Retirement (20.4% of Base Pay) ²	46,241
Life & Health Insurance (3.7% of Base Pay) ²	8,387
Workmen's Compensation, Bonuses & Awards, Unemployment Programs (1.9% of Base Pay) ²	4,307
Shore Leave (10.5% of Base Pay)	23,800
Annual, Sick & Military Leave	50,400
Travel	<u>2,100</u>
Subtotal direct and indirect manpower costs	570,310
MILDET	61,361
MSC Overhead (5% of \$631,671) ²	<u>31,584</u>
Total Manpower Cost	663,255

¹Data obtained from MSC Manning and Wage Scale tables and
computed to include overhead costs.

²Based on OMB Circular A-76

TABLE A-24

TATF-158 NAVY CIVIL SERVICE MANNING AND

BASE PAY¹ (FY77\$)

	BASE WAGE	TOTAL
1 Master	44,260	44,260
1 1st Officer	18,374	18,374
1 2nd Officer	16,541	16,541
1 3rd Officer	14,708	14,708
1 Bosun Mate	10,862	10,862
6 Able Seaman	9,116	<u>54,696</u>
Subtotal		159,441
1 Chief Engineer	39,893	39,893
1 1st Asst Engr	20,609	20,609
1 2nd Asst Engr	17,077	17,077
1 3rd Asst Engr	15,184	15,184
1 Electrician	14,094	14,094
1 Eng Utilityman	10,524	10,524
3 Oiler	9,809	29,427
1 Wiper	8,466	8,466
1 Eng Utilityman	1,882	<u>1,882</u>
Subtotal		157,156

TABLE A-24 (cont.)

TATF-158 NAVY CIVIL SERVICE MANNING AND

BASE PAY (FY77\$)

	BASE WAGE	TOTAL
1 Steward Cook	11,159	11,159
1 Cook Baker (fgtr)	10,374	10,374
1 Messman	7,067	7,067
1 Utilityman	7,067	<u>7,067</u>
Subtotal		35,667
1 Purser	20,688	20,688
Total Base Pay		372,952

¹This data was provided by MSC from their FY 1977 Manning and Wage Scales.

TABLE A-25

TATF-158 NAVY CIVIL SERVICE OPERATION-TOTAL

MANPOWER COST¹ (FY77\$)

Total Base Pay	372,952
Overtime	332,546
Premium/Penalty Pay	51,542
Subsistence	39,420
Other (Relief Officers, Awaiting Assignment, Training, Damage Control Instruction)	8,000
Retirement (20.4% of Base Pay) ²	76,082
Life & Health Insurance (3.7% of Base Pay) ²	13,799
Workman's Compensation, Bonuses & Awards, Unemployment Programs (1.9% of Base Pay) ²	7,086
Shore Leave (10.5% of Base Pay)	39,160
Annual, Sick & Military Leave	94,000
Travel	<u>2,000</u>
Subtotal direct and indirect manpower costs	1,016,587
MILDET	88,589
MSC Overhead (5% of \$1,105,176) ²	<u>55,259</u>
Total Manpower Cost	1,160,435

¹Data obtained from MSC Manning and Wage Scale tables and computed to include overhead costs.

²Based upon OMB Circular A-76

TABLE A-26

TAF-58 NAVY CIVIL SERVICE OPERATION-TOTAL MANPOWER COST FROM NUCLEUS
SHIP EXPENSE REPORT

(FY77\$)

Total Base Pay (51011)	1,210,900
Total Case Pay (Damage Control Instructors)	3,371
(51012)	
Overtime (51020)	715,739
Relief Officers (5103)	254
Shore Leave (5105)	134,500
Other Premium Pay (5107)	101,555
Annual, Sick & Military Leave (5108)	236,891
Indoctrination & Training (5109)	1,675
Awaiting Assignment (5110)	3,982
Life & Health Insurance (5112 & 5114) (3.7% of 51011) ¹	44,803
Retirement Contributions (5113) (20.4% of 51011) ¹	247,024
Workmen's Compensation, Bonuses & Awards,	23,007
Unemployment Compensation (1.9% of 51011) ¹	
Crew Subsistence (5121)	147,263
Non-crew Subsistence (5123)	502
Total Direct and Indirect Manpower Costs	2,871,466
MILDET	298,879
MSC Overhead (5% of \$3,170,345) ¹	158,517
Total Manpower Cost	3,328,862

¹Based on OMB Circular A-76

TABLE A-27

TAO-105 NAVY CIVIL SERVICE OPERATION-TOTAL MANPOWER COST FROM NUCLEUS
SHIP EXPENSE REPORT
(FY77\$)

Total Base Pay (51011)	1,549,776
Total Base Pay (Damage Control Instructors) (51012)	9,823
Overtime (51020)	634,521
Relief Officers (5103)	40,588
Shore Leave (5105)	188,292
Other Premium Pay (5107)	110,380
Annual, Sick & Military Leave (5108)	318,169
Indoctrination & Training (5109)	24,128
Awaiting Assignment (5110)	46,102
Life & Health Insurance (5112 & 5114) (3.7% of 51011) ¹	57,342
Retirement Contributions (5113) (20.4% of 51011) ¹	316,154
Workmen's Compensation, Bonuses & Awards, Unemployment Compensation (1.9% of 51011) ¹	29,446
Crew Subsistence (5121)	131,069
Non-crew Subsistence (5123)	700
Total Direct and Indirect Manpower Costs	3,456,490
MILDET	232,516
MSC Overhead (5% of \$3,689,006) ¹	184,450
Total Manpower Cost	3,873,456

¹Based on OMB Circular A-76

TABLE A-28

TATF-158 NAVY CIVIL SERVICE OPERATION-TOTAL MANPOWER COST FROM NUCLEUS

SHIP EXPENSE REPORT

(FY77\$)

Total Base Pay (51011)	358,982
Total Base Pay (Damage Control Instructors) (51012)	3,336
Overtime (51020)	240,763
Relief Officers (5103)	19,046
Shore Leave (5105)	40,300
Other Premium Pay (5107)	70,410
Annual, Sick & Military (5108)	88,917
Indoctrination & Training (5109)	1,230
Awaiting Assignment (5110)	2,959
Life & Health Insurance (5112 & 5114) (3.7% of 51011) ¹	13,282
Retirement Contributors (5113) (20.4% of 51011) ¹	73,238
Workmen's Compensation, Bonuses & Awards,	6,821
Unemployment Compensation (1.9% of 51011) ¹	
Crew Subsistence (5121)	29,288
Non-Crew Subsistence (5123)	<u>68</u>
Total Direct and Indirect Manpower Costs	948,640
MILDET	88,589
MSC Overhead (5% of \$1,037,229) ¹	<u>51,861</u>
Total Manpower Cost	1,089,090

¹Based on OMB Circular A-76

TABLE A-29

TAF-58 NAVY CIVIL SERVICE OPERATION-TOTAL MANPOWER COST

JMC DATA/CIV77 METHODOLOGY

(FY77\$)

Total Base Pay	1,423,688
Overtime	896,924
Premium/Penalty Pay	98,827
Subsistence	169,360
Other (Relief Officers, Awaiting Assignment, Training, Damage Control Instruction)	6,000
Retirement (20.4% of Base Pay) ¹	290,432
Life & Health Insurance (3.7% of Base Pay) ¹	52,676
Workmen's Compensation, Bonuses & Awards, Unemployment Programs (1.9% of Base Pay) ¹	27,050
Shore Leave (10.5% of Base Pay)	149,487
Annual, Sick & Military Leave	391,000
Travel	<u>24,000</u>
Subtotal Direct and Indirect Manpower Costs	3,529,444
MILDET	298,879
MSC Overhead (5% of 3,828,323) ¹	<u>191,416</u>
Total Manpower Cost	4,019,739

¹Based on OMB Circular A-76

TABLE A-30

TAO-105 NAVY CIVIL SERVICE OPERATION-TOTAL MANPOWER COST

JMC DATA/CIV77 METHODOLOGY

(FY77\$)

Total Base Pay	1,617,690
Overtime	940,560
Premium/Penalty Pay	94,023
Subsistence	153,300
Other (Relief Officers, Awaiting Assignment, Training, Damage Control Instruction)	61,000
Retirement (20.4% of Base Pay) ¹	330,009
Life & Health Insurance (3.7% of Base Pay) ¹	59,855
Workmen's Compensation, Bonuses & Awards,	30,736
Unemployment Programs (1.9% of Base Pay) ¹	
Shore Leave (10.5% of Base Pay)	169,857
Annual, Sick & Military Leave	247,000
Travel	<u>93,000</u>
Subtotal Direct and Indirect Manpower Costs	3,797,030
MILDET	232,516
MSC Overhead (5% of \$4,029,546) ¹	<u>201,477</u>
Total Manpower Cost	4,231,023

¹Based on OMB Circular A-76

TABLE A-31
TATF-158 NAVY CIVIL SERVICE OPERATION-TOTAL MANPOWER COST
JMC DATA/CIV77 METHODOLOGY
(FY77\$)

Total Base Pay	441,747
Overtime	341,807
Premium/Penalty Pay	31,752
Susbsistence	40,880
Other (Relief Officers, Awaiting Assignment, Training, Damage Control Instruction)	8,000
Retirements (20.4% of Base Pay) ¹	90,116
Life & Health Insurance (3.7% of Base Pay)	16,345
Workmen's Compensation, Bonuses & Awards,	8,393
Unemployment Programs (1.9% of Base Pay) ¹	
Shore Leave	46,393
Annual, Sick & Military Leave	94,000
Travel	<u>2,000</u>
Subtotal Direct and Indirect Manpower Costs	1,121,423
MILDET	88,589
MSC Overhead (5% of \$1,210,012) ¹	<u>60,501</u>
Total Manpower Cost	1,270,513

¹Based on OMB Circular A-76

CIVIL SERVICE

A-32 - Rigel
 Manning Scale 1-4 January 3, 1978
 RJ-S-4a Steam Turbine
 Dry Class A-1 Atlantic
 (Yearly Salaries)

	#	Subtotal	Total
1 Master D	47,500	47,500	
2 1st Officer D	27,200	54,400	
3 2nd Officer W	19,296	19,296	
3 3rd Officer W	17,330	52,036	
1 Fleet Line Officer (UNREP)	22,356	22,356	
6 Subtotal		195,564	
2 Deckswain (gtr) over 10,000GT	13,936	27,872	
1 Carpenter (gtr) over 10,000GT	12,578	12,578	
1 Gun/yeoman-Storekeeper (UNREP)	17,411	17,411	
2 Yeoman-Storekeeper (Deck)	10,968	21,936	
5 Gun/yeoman's Rate D	11,435	57,175	
6 Able Seamen	9,596	57,576	
25 Able Seamen Maintenance	10,716	267,900	
3 Ordinary Seamen	7,499	22,490	
4 Subtotal		400,910	600,464
23 Total Deck			
1 Chief Engineer D	43,564	43,564	
1 1st Asst't Engineer D	27,200	27,200	
1 2nd Asst't Engineer W	19,296	19,296	
3 3rd Asst't Engineers W	17,330	52,036	
1 3rd Asst't Engineer D	22,172	22,172	
7 Subtotal		160,464	
2 Deck Engineers			
3 Chief, Jr. Engineers W	11,764	23,528	
1 Electrician D over 10,000 GT	15,131	36,399	
3 Refrigeration Engineers (Refrig. Cargo) W	15,370	15,370	
1 Machinist	11,000	35,704	
1 Yeoman Storekeeper (Engine)	12,432	12,432	
1 Electricians D	10,968	10,968	
2 2nd Electricians D	13,800	27,740	
3 Engine Utilitymen	11,070	33,234	
3 Oilers	9,596	28,770	
3 Refrigeration Oilers	9,596	28,770	
1 Fireman - WaterTenders	9,596	28,770	
4 Vipers	8,911	35,622	
29 Subtotal		317,441	402,105
36 Total Engine			

A-32
 Table A-32 TAF-58 Navy
 Civil Service Base Pay
 From JMC Backup Tables

	#	Subtotal	Total
1 Chief Steward (gtr) over 10,000GT	13,936	13,936	
1 3rd Steward	9,608	9,608	
1 Chief Cook	11,206	11,206	
2 Cook-bakers (gtr)	10,968	21,936	
1 3rd Cook (gtr)	9,403	9,403	
6 Messmen	7,430	44,636	
10 Utilitymen	7,430	74,300	
1 3rd Buttryman	8,041	8,041	
23 Subtotal		193,230	193,230
1 Nurse Special Mission	23,075	23,075	
1 Junior Nurse	10,137	10,137	
1 Yeoman-Storekeeper (Nurse)	10,668	10,668	
3 Total Nurse		52,180	52,180
1 Nurse Special Project	15,691	15,691	
23 Subtotal		15,691	15,691
Total Homing			1,423,600
X 1.6			2,277,600

Civil Service

AF - Rigel

<u>Category</u>		<u>Cost</u>
Total Manning	1,423,688	
X 1.6	2,277,901	2,277,901
Overtime	.695 x 1,423,688	989,463
Relief Officers		
Indoctrination & training	.0014 x 2,277,901	3,189
Retirement	.247 x 2,277,901	562,641
Life & Health Insurance	.04 x 2,277,901	91,116
Shore Leave	.111 x 1,423,688	158,029
Annual, sick & military leave	.196 x 2,277,901	446,469
Social Security	.0083 x 2,277,901	<u>18,907</u>
		4,547,715

Table A-33 TAF-58 Navy
Civil Service Manpower Cost
From JMC Backup Tables

TABLE 10-A

ANNUAL CIVIL SERVICE MANPOWER ECONOMIC COSTS: AF
(Thousands of FY '77 dollars)

Number of Ships in Fleet: 1

CATEGORY	ANNUAL ECONOMIC COST PER SHIP	ANNUAL ECONOMIC COST FLEET
A. Direct Labor Costs		
1. Regular Wages ^{1/}	\$2,278	\$2,278
2. Overtime ^{2/}	989	989
3. Relief Officers	3 ^{3/}	3 ^{3/}
4. Indoctrination & training	3	3
B. Fringe Benefits		
1. Retirement	563	563
2. Life & Health Insurance	91	91
3. Leave ^{4/}	605	605
4. Social Security	19	19
TOTAL	\$4,548	\$4,548

NOTES:

^{1/} Includes base wages plus non-watch pay for full crew. Assumes 60 percent crew reserve for vacations, sick days, etc. Does not include radio officers, who are accounted for in Military Detachment.

^{2/} Includes overtime, premium pay, and compensatory time pay, but does not include cost of compensatory time taken in days off, for which no data is available.

^{3/} This ship incurred no relief officer expense during FY '77.

^{4/} Includes annual, sick, military and shore leave.

Source: Calculated from "Revision of Atlantic and Pacific Schedule of Wages of all Civilian Marine Personnel," 17 October, 1977; and MSC Nucleus Ship Expense Reports FY '77.

Table A-34 TAF-58 Fleetwide
Navy Civil Service Manpower Cost
From JMC Table 10-A

Civil Service		
AO - Million		
<u>Category</u>		<u>Cost</u>
Total Manning	1,617,690	
X 1.6	2,588,304	2,588,304
Overtime	.559 x 1,617,690	904,289
Relief Officers	.026 x 1,617,690	42,367
Indoctrination & training	.0156 x 2,588,304	40,378
Retirement	.247 x 2,588,304	639,311
Life & Health Insurance	.04 x 2,588,304	103,532
Shore Leave	.121 x 1,617,690	195,741
Annual, sick & military leave	.205 x 2,588,304	530,602
Social Security	.0079 x 2,588,304	20,552
		5,065,076

Table A-36 TAO-105 Navy
Civil Service Manpower Cost
From JMC Backup Tables

TABLE 10-B

ANNUAL CIVIL SERVICE MANPOWER ECONOMIC COSTS: AO
(Thousands of FY 77 dollars)

CATEGORY	ANNUAL ECONOMIC COST PER SHIP	Number of Ships in Fleet: 16	ANNUAL ECONOMIC COST FLEET ^{1/}
A. Direct Labor Costs			
1. Regular Wages ^{1/}	\$2,588		\$41,413
2. Overtime ^{2/}	904		14,469
3. Relief Officers	42		678
4. Indoctrination & training	40		646
B. Fringe Benefits			
1. Retirement	639		10,229
2. Life & Health Insurance	104		1,657
3. Leave ^{3/}	776		11,621
4. Social Security	21		329
TOTAL	\$5,065^{4/}		\$71,042

NOTES:

- 1/ Includes base wages plus non-watch pay for full crew. Assumes 60 percent crew reserve for vacations, sick days, etc. Does not include radio officers, who are accounted for in military detachment.
- 2/ Includes overtime, premium pay, and compensatory time pay, but does not include cost of compensatory time taken in days off, for which no data is available.
- 3/ Includes annual, sick, military and shore leave.
- 4/ Calculated on numbers before rounding.

Sources: Calculated from "Revision of Atlantic and Pacific Schedule of Wages of all Civilian Marine Personnel," 17 October, 1977; and MSC Nucleus Ship Expense Reports FY 77.

Table A-37 TAO-105 Fleetwide
Navy Civil Service Manpower Cost
From JMC Table 10-B

CIVIL SERVICE			
ATF - Mosopeles			
Manning Scale L-4, effective August 16, 1977			
Tug - Diesel Electric			
Pay Class E-Diesel - ATLANTIC			
	E	Subtotal	Total
1 Master D	48,388	48,388	
1 1st Officer D	25,561	25,561	
1 2nd Officer W	17,976	17,976	
1 3rd Officer W	15,983	15,983	
1 Subtotal		107,908	
1 Boatswain Mate D	12,574	12,574	
6 Able Seamen	10,556	63,336	
1 Subtotal		75,910	
11 Total Deck			183,818
1 Chief Engineer D	41,997	41,997	
1 1st Ass't Engineer E	25,561	25,561	
1 2nd Ass't Engineer W	17,976	17,976	
1 3rd Ass't Engineer W	15,983	15,983	
1 Subtotal		101,517	
1 Electrician under 10,000 GT	16,319	16,319	
2 Engine Utilitymen	12,157	24,374	
1 Oiler (Diesel)	11,359	34,077	
1 Wiper	9,804	9,804	
7 Subtotal		84,574	
11 Total Engine			186,091
1 Steward Cook (fgtr)	12,921	12,921	
1 Cook Baker (fgtr)	12,012	12,012	
1 Messman	8,153	8,153	
2 Utilitymen	8,153	16,306	
5 Total Steward		49,482	49,482
1 Purser (fgtr)	22,356	22,356	
1 Total Purser			22,356
28 Total Manning			441,747
X 1.6			706,795

Table A-38 TATF-158 Navy
Civil Service Base Pay
From JMC Backup Tables

Civil Service
ATF - Mosopeles

<u>Category</u>		<u>Cost</u>
Total Manning	441,747	
X 1.6	706,795	2 706,795
Overtime	.941 x 441,747	415,684
Relief Officers	1,653 hours @ \$10.38	17,158
Indoctrination & training	.0034 x 706,795	2,403
Retirement	.2-7 x 706,795	174,578
Life & Health Insurance	.04 x 706,795	28,272
Shore Leave	.112 x 441,747	49,476
Annual, sick & other Leave	.248 x 706,795	175,285
Social Security	.0034 x 706,795	2,403
		5 1,572,054

Table A-39 TATF-158 Navy
Civil Service Manpower Cost
From JMC Backup Tables

TABLE 10-C
ANNUAL CIVIL SERVICE MANPOWER ECONOMIC COSTS: ATF
(Thousands of FY 77 dollars)

Number of Ships in Fleet 7		
CATEGORY	ANNUAL ECONOMIC COST PER SHIP	ANNUAL ECONOMIC COST FLEET ^{1/}
A. Direct Labor Costs		
1. Regular Wages ^{1/}	\$ 707	\$ 4,948
2. Overtime ^{2/}	416	2,910
3. Relief Officers	17	120
4. Indoctrination & training	2	17
B. Fringe Benefits		
1. Retirement	175	1,222
2. Life & Health Insurance	28	198
3. Leave ^{3/}	225	1,573
4. Social Security	2	17
TOTAL	\$1,572	\$11,005

NOTES:

1/ Includes base wages plus non-watch pay for full crew. Assumes 60 percent crew reserve for vacations, sick days, etc. Does not include radio officers, who are accounted for in military detachment.

2/ Includes overtime, premium pay, and compensatory time pay, but does not include cost of compensatory time taken in days off, for which no data is available.

3/ Includes annual, sick, military and shore leave.

4/ Calculated on numbers before rounding.

Source: Calculated from "Revision of Atlantic and Pacific Schedule of Wages of all Civilian Marine Personnel," 17 October, 1977; and MSC Nucleus Ship Expense Reports FY 77.

Table A-40 TATF-158 Fleetwide
Navy Civil Service Manpower Cost
From JMC Table 10-C

TABLE A-41 TAF-58
COMMERCIAL CONTRACT MANNING
AND RELATED COSTS

(FY 77 DOLLARS)

	BASE WAGE	NWA	VACATION	PENSION	WELFARE/ MEDICAL	FEINBERG	TRAINING/ LUNDBERG	EMPLOYMENT COMMISSION	SPECIAL ACCOUNT	OVERTIME	TOTAL
1 Master	2765.04	774.28	2757.84	603.00	165.90	551.07	180.00	16.50			7813.63
1 Chief Mate	1500.95	420.31	1187.15	603.00	165.90	435.74	180.00	16.50			4509.55
1 Second Mate	1759.91		1075.60	603.00	165.90	435.74	180.00	16.50			3836.65
2 Third Mate	2437.72		1928.03	1206.00	331.80	871.47	360.00	33.00		5644.53	7168.02
Deck Officers											5644.53
1 Chief Engineer	2581.08	722.73	1875.57	1004.03	136.38	570.20	11.52	18.78	28.20		6948.49
1 1st Asst. Engr.	1572.42	440.30	1142.62	611.67	136.38	374.02	11.52	18.78	28.20		4335.91
1 2nd Asst. Engr.	1424.66	398.90	1035.24	554.18	136.38	365.28	11.52	18.78	28.20		3953.14
3 3rd Asst. Engr.	3830.72	1072.68	2783.66	1490.14	409.14	949.64	34.56	56.34	84.60		10711.48
2 3rd Asst. Engr.	2553.81		1855.77	993.43	272.76	633.09	23.04	37.56	56.40		6425.86
Engine Officers										8373.88	8373.88
1 RFO	1583.11		1205.70	615.82	259.20	437.51		21.00	28.20		4150.54
1 Purser	1055.13		532.90	450.90	62.55	188.28		30.00		1108.18	1108.18
6 Basin	5811.30		2556.97	2624.40	423.00		207.00	135.00	90.00		2409.76
1 Carpenter	891.00		392.04	437.40	70.50		34.50	22.50			11757.67
4 Storekeeper	3363.88		1480.10	1749.60	282.00		138.00	90.00			1847.94
26 Able Seamen	19164.13		8432.21	11372.39	1833.00		897.00	585.00			2103.58
Unl Deck										21199.80	42763.73
2 Chief Electr.	2279.31		1002.90	874.80	141.00		69.00	45.00			21199.80
1 Machinist	954.90		420.16	437.40	70.50		34.50	22.50			4412.01
5 Unlfc Jr. Engr.	4659.41		2050.14	2187.00	352.50		172.50	112.50			1939.96
3 Refer/Officer	2211.25		972.95	1312.20	211.50		103.50	67.50			9536.05
3 FWT	2211.25		972.95	1312.20	211.50		103.50	67.50			4678.90
3 Refer Engr.	3195.83		1406.17	1312.20	211.50		103.50	67.50			4678.90
2 Engine Utility	1702.01		748.88	874.80	141.00		69.00	45.00			6296.70
3 Wipers	2053.75		903.65	1312.20	211.50		103.50	67.50			3580.69
Unl Engineer										13487.38	4652.10
1 Chief Steward	968.55		426.16	437.40	70.50		34.50	22.50			1959.61
1 Chief Cook	860.74		378.72	437.40	70.50		34.50	22.50			1804.36
1 Third Cook	728.43		320.51	437.40	70.50		34.50	22.50			1613.84
2 Cook/Baker	1677.88		738.27	874.80	141.00		69.00	45.00			3545.95
17 Utilitymen	9713.16		4273.79	7435.80	1198.50		586.50	382.50			23590.25
Steward										9764.13	9764.13
96 TOTALS	85111.33	3829.20	44856.65	44164.56	7952.79	5792.04	3786.66	2106.24	343.80	59577.90	257521.17
X 12 MONTHS	1,021,336.00	45,950.40	538,279.80	529,974.72	95,433.48	69,504.48	45,439.92	25,274.88	4,125.60	716,934.80	3090254.00

TABLE A-42
TAF-58 COMMERCIAL
CONTRACT MANPOWER COST
(FY 77\$)

DIRECT LABOR COSTS

Base Pay	1,021,336
Non-watch Pay	45,950
Overtime	714,935
Indoctrination & Training	
Training/Lundberg	45,440
Employment Commission	25,275
Special Account	4,126

Fringe Benefits

Retirement	529,975
Life and Health Insurance	95,433
Annual Leave	538,279
Social Security Payroll Tax	92,664
Miscellaneous	
Feinberg	69,504

Total Direct and Indirect Manpower Costs	3,182,917
P&I Insurance	452,640
MILDET	448,723
MSC Overhead (4% of \$4,084,280) ¹	163,371
Total Commercial Contract Manpower Cost	4,247,651

¹Based OMB Circular A-76

TABLE A-43 TAO-177
COMMERCIAL CONTRACT MANNING
AND RELATED COSTS

	BASE WAGE	NMA	VACATION	PENSION	WELFARE/ MEDICAL		FEINBERG	TRAINING/ LUNDBERG	EMPLOYMENT COMMISSION		SPECIAL ACCOUNT	OVERTIME	TOTAL
1 Master	2677.41	749.70	3281.46	603.00	165.90	679.17	165.00	16.50					8338.13
1 Chief Mate	1692.79	474.02	1723.26	603.00	165.90	563.83	165.00	16.50					5404.30
1 Second Mate	1496.93		1523.87	603.00	165.90	563.83	165.00	16.50					4515.03
2 Third Mate	2602.08		2648.92	1206.00	331.80	1127.67	330.00	33.00					8279.45
Deck Officers												5928.44	
1 Chief Engineer	2573.83	720.70	2493.96	1021.30	136.38	771.83	11.52	18.78			28.20		7776.49
1 1st Asst Eng	1773.39	496.58	1718.37	703.69	136.38	560.07	11.52	18.78			28.20		5446.97
1 2nd Asst Eng	1568.20		1519.55	622.27	136.38	505.79	11.52	18.78			28.20		4410.69
2 3rd Asst Eng	2725.98	763.36	2641.43	1081.69	272.76	903.01	23.04	37.56			56.40		8505.23
2 3rd Asst Eng	2725.98		2641.43	1081.69	272.76	903.01	23.04	37.56			56.40		7741.86
Engine Officers												7957.16	
1 REO	1856.99		1810.28	722.37	259.20	654.41		21.00			28.20		5372.44
Radio Officer												1299.89	
1 Purser/MPA	1355.57		680.88	450.90	62.55	188.28		30.00			90.00		2858.18
1 Basun	1032.94		610.09	480.60	77.70			34.50					2278.33
26 Able Seamen	19389.50		11827.59	12495.59	2020.20			897.00			585.00		47214.88
3 Ordinary Seamen	1773.21		1081.66	1441.80	233.10			103.50			67.50		4700.76
3 Electrician	3420.18		2086.31	1441.80	233.10			103.50			67.50		7352.38
Unl Deck												15536.95	
3 Unlic Jr Engr	2516.85		1535.28	1441.80	233.10			103.50			67.50		5898.02
3 Unlic Jr Engr	2795.34		1705.16	1441.80	233.10			103.50			67.50		6346.38
3 FMT	2237.25		1364.72	1441.80	233.10			103.50			67.50		5447.86
1 Chief Pumpman	1042.43		635.88	480.60	77.70			34.50			22.50		2293.61
1 2nd Pumpman	928.30		566.26	480.60	77.70			34.50			22.50		2109.86
Unl Engineer												11644.13	
2 Starekeeper	1640.30		1000.58	961.20	155.40			69.00			45.00		3871.48
3 Wiper	2053.83		1252.84	1441.80	233.10			103.50			67.50		5152.55
1 Chief Steward	1037.09		632.62	480.60	77.70			34.50			22.50		2288.01
1 Chief Cook	895.97		546.54	480.60	77.70			34.50			22.50		2057.81
2 Cook & Baker	1551.62		946.49	961.20	155.40			69.00			45.00		3728.71
1 Asst Cook	775.81		473.24	480.60	77.70			34.50			22.50		1864.35
16 Utilityman	9141.60		5576.37	7689.59	1243.20			552.00			360.00		24562.76
Steward												10310.36	
Total	75,281.25	3,204.36	54,565.00	42,340.85	7,544.89	7,420.91	3,320.63	1,839.96			315.60	52,696.92	248,530.31
X 12 Months	903,375.00	38,452.32	654,780.00	508,090.20	90,538.68	89,050.92	39,847.56	22,079.50			3,787.20	632,363.04	2,982,363.70

Table A-44
TAO-177 COMMERCIAL
CONTRACT MANPOWER COST
(FY 77\$)

DIRECT LABOR COSTS

Base Pay	903,375
Non-watch Pay	38,452
Overtime	632,363
Indoctrination & Training	
Training/Lundberg	39,848
Employment Commission	22,080
Special Account	3,787
 Fringe Benefits	
Retirement	508,090
Life and Health Insurance	90,539
Annual Leave	654,780
Social Security Payroll Tax	81,081
Miscellaneous	
Feinberg	89,051
 Total Direct and Indirect Manpower Costs	3,063,446
P&I Insurance	399,840
MILDET	318,546
MSC Overhead (4% of \$3,781,832) ¹	151,273
 Total Commercial Contract Manpower Cost	3,933,105

¹Based on OMB Circular A-76

TABLE A-45 TAO-105
COMMERCIAL CONTRACT MANNING
AND RELATED COSTS

	BASE WAGE	NWA	VACATION	PENSION	WELFARE/ MEDICAL	FEINBERG	TRAINING/ LUNDBERG	EMPLOYMENT COMMISSION	SPECIAL ACCOUNT	OVERTIME	TOTAL
1 Master	2677.41	749.70	3281.46	603.00	165.90	679.17	165.00	16.50			8338.13
1 Chief Mate	1692.79	474.02	1723.26	603.00	165.90	561.83	165.00	16.50			5404.30
1 Second Mate	1496.93		1523.87	603.00	165.90	561.83	165.00	16.50			4535.03
2 Third Mate	2602.08		2648.92	1206.00	331.80	1427.67	310.00	33.00		5928.44	8279.45
Deck Officers											5928.44
1 Chief Engineer	2573.83	720.70	2493.96	1021.30	136.38	771.83	11.52	18.78	28.20		7776.49
1 1st Asst. Engr.	1773.39	496.58	1718.37	703.69	136.38	560.07	11.52	18.78	28.20		5446.97
1 2nd Asst. Engr.	1568.20		1519.55	622.27	136.38	505.79	11.52	18.78	28.20		4410.69
2 3rd Asst. Engr.	2725.98	763.36	2641.43	1081.69	272.76	903.01	23.04	37.56	56.40		8505.23
5 3rd Asst. Engr.	6814.95		6603.57	2704.24	681.90	2257.54	57.60	93.90	141.00	10819.44	19354.68
Engine Officers											10819.44
1 REO	1856.99		1830.28	722.37	259.20	654.41		21.00	28.20		5372.44
1 Purser/MPA	1355.57		680.88	450.90	62.55	188.28		30.00		1299.89	2898.18
1 Bosun	1032.94		630.09	480.60	77.70		34.50	22.50	90.00		2278.33
3 Quartermaster	2289.33		1396.49	1441.80	233.10		103.50	67.50			5531.71
23 Able Seamen	17152.25		10462.87	11053.79	1787.10		793.50	517.50			41767.00
3 Ordinary Seamen	1773.21		1081.66	1441.80	233.10		103.50	67.50		15573.41	4700.76
Unl Deck											15573.41
3 Electrician	3420.18		2086.31	1441.80	233.10		103.50	67.50			7352.38
3 Unllic Jr. Engr.	2516.85		1535.28	1441.80	233.10		103.50	67.50			5898.02
3 Unllic Jr. Engr.	2795.34		1705.16	1441.80	233.10		103.50	67.50			6346.38
3 FWT	2237.25		1364.72	1441.80	233.10		103.50	67.50			5447.86
1 Chief Pumpman	1042.43		635.88	480.60	77.70		34.50	22.50			2293.61
2 2nd Pumpman	1856.60		1132.52	961.20	155.40		69.00	45.00			4219.72
2 Storekeeper	1640.30		1000.58	961.20	155.40		69.00	45.00			3871.48
2 Wiper	2053.83		1252.84	1441.80	233.10		103.50	67.50		12293.93	5152.55
Unl Engineer											12293.93
1 Chief Steward	1037.09		632.62	480.60	77.70		34.50	22.50			2285.01
1 Chief Cook	895.97		546.54	480.60	77.70		34.50	22.50			2057.81
2 Cook & Baker	1551.62		946.49	961.20	155.40		69.00	45.00			3728.71
1 Asst. Cook	775.81		473.24	480.60	77.70		34.50	22.50			1864.35
16 Utilitymen	9141.60		5576.37	7689.59	1243.20		552.00	360.00		10330.36	24562.76
Steward											10330.36
AA TOTALS	90150.44	3204.36	59155.17	44447.99	8071.72	8775.44	3389.69	1919.90	400.20	56245.47	265805.44
X 12 MONTHS	964,205.28	38,452.32	709,502.04	533,327.88	96,380.76	105,305.28	40,676.28	23,025.60	4,802.40	674,945.64	3,906,275.30

TABLE A-46
TAO-105 COMMERCIAL
CONTRACT MANPOWER COST
(FY 77\$)

Direct Labor Costs

Base Pay	964,205
Non-watch Pay	38,452
Overtime	674,946
Indoctrination & Training	
Training/Lundberg	40,676
Employment Commission	23,026
Special Account	4,802

Fringe Benefits

Retirement	533,328
Life and Health Insurance	96,381
Annual Leave	709,502
Social Security Payroll Tax	83,977
Miscellaneous	
Feinberg	105,305

Total Direct and Indirect Manpower Costs	3,274,600
P&I Insurance	414,120
MILDET	232,516
MSC Overhead (4% of \$3,921,236) ¹	156,849

Total Commercial Contract Manpower Cost	4,078,085
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¹Based on OMB Circular A-76

TABLE A-47 TATF-166
COMMERCIAL CONTRACT MANNING
AND RELATED COSTS

	BASE WAGE	NWA	VACATION	PENSION	WELFARE/ MEDICAL	FEINBERG	TRAINING/ LUNDBERG	EMPLOYMENT COMMISSION	SPECIAL ACCOUNT	OVERTIME	TOTAL
1 Master	2519.82	705.59	2513.24	603.00	165.90	551.07	180.00	16.50			7255.11
1 Chief Mate	1383.57	387.46	1094.32	603.00	165.90	435.74	180.00	16.50			4266.47
1 Second Mate	1250.68		989.18	603.00	165.90	435.74	180.00	16.50			3641.00
1 Third Mate	1117.81		884.10	603.00	165.90	435.74	180.00	16.50			3403.04
Deck Officers										4390.31	
1 Chief Engineer	2451.76	686.53	1781.61	953.73	136.38	545.05	11.52	18.78	28.20		6613.55
1 1st Asst Engr	1449.45	405.89	1053.27	563.84	136.38	350.11	11.52	18.78	28.20		4017.44
1 3rd Asst Engr	1171.03		850.95	455.53	136.38	295.96	11.52	18.78	28.20		2968.35
Engine Officers										3550.57	
1 RFO, FPR	1636.77		1246.57	636.69	259.20	447.95		21.00	28.20		4276.38
Radio Officer										1145.74	
1 Boson	968.55		426.16	437.40	70.50		34.50	22.50			1959.61
3 Able Seamen	2211.25		972.95	1312.20	211.50		103.50	67.50			4878.88
2 Ordinary Seamen	1150.87		506.38	874.80	141.00		69.00	45.00			2787.05
3 Quartermaster	2211.25		972.95	1312.20	211.50		103.50	67.50			4878.88
3 Deckac	3195.83		1406.17	1312.20	211.50		103.50	67.50			6296.69
Unl Deck										4579.33	
1 Unl Jr. Engr	931.88		410.03	437.40	70.50		34.50	22.50			1906.81
Unl Engineer										2889.40	
1 Third Cook	728.43		320.51	437.40	70.50		34.50	22.50			1613.84
2 Utilitymen	1142.73		502.80	874.80	141.00		69.00	45.00			2775.32
1 Steward/Cook	1100.61		484.27	437.40	70.50		34.50	22.50			2149.78
Steward										2080.74	
TOTAL	26,622.25	2,185.47	16,415.43	12,457.57	2,530.44	3,497.34	1,341.06	525.84	112.80	18,635.57	84,323.69
x 12 months	319,467.00	26,225.64	196,985.16	149,490.84	30,365.28	41,968.08	16,092.72	6,310.08	1,353.60	223,626.84	1,011,886.3

Table A-48
TATF-166 COMMERCIAL
CONTRACT MANPOWER COST
(FY 77\$)

Direct Labor Costs

Base Pay	319,467
Non-watch Pay	26,226
Overtime	223,627
Indoctrination & Training	
Training/Lundberg	16,093
Employment Commission	6,130
Special Account	1,354

Fringe Benefits

Retirement	149,491
Life and Health Insurance	30,365
Annual Leave	196,985
Social Security Payroll Tax	23,166
Miscellaneous	
Feinberg	41,968

Total Direct and Indirect Manpower Costs	1,034,872
P&I Insurance	126,500
MILDET	155,921
MSC Overhead (4% of \$1,317,293) ¹	52,692

Total Commercial Contract Manpower Cost	1,369,985
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¹Based on OMB Circular A-76

TABLE A-49 TATE-158
COMMERCIAL CONTRACT MANNING

(FY 77 DOLLARS)											
	BASE WAGE	NVA	VACATION	PENSION	WELFARE/ MEDICAL	FETTERBERG	TRAINING/ TURBBERG	EMPLOYMENT COMMISSION	SPECIAL ACCOUNT	OVERTIME	TOTAL
1 MASTER	2519.82	705.59	2513.24	603.00	165.90	551.07	180.00	16.50			7255.12
1 CHIEF MATE	1383.57	387.46	1094.32	603.00	165.90	435.74	180.00	16.50			4766.49
1 2nd Mate	1250.68		989.18	603.00	165.90	435.74	180.00	16.50			3641.00
Deck Officers											
1 Chief Engineer	2451.76	686.53	1781.61	953.73	136.38	545.05	11.52	18.78	28.20		6613.56
1 1st Asst. Engr	1449.45	405.89	1053.27	563.84	136.38	350.11	11.52	18.78	28.20		4017.44
1 3rd Asst. Engr	1171.03		850.95	455.53	136.38	295.96	11.52	18.78	28.20		2968.35
Engine Officers											
1 Bosun	968.53		426.16	437.40	70.50		34.50	22.50			1959.61
2 Able Seamen	1474.17		648.95	874.80	141.00		69.00	45.00			3252.92
3 Quartermasters	2211.25		972.95	1312.20	211.50		103.50	67.50			4878.90
1 Deck Mechanic	1065.28		468.72	437.40	70.50		34.50	22.50			2098.90
Unl Deck											
1 Chief Electr	1139.66		501.45	437.40	70.50		34.50	22.50			2206.01
3 Jr. Engr.	2795.64		1230.09	1312.20	211.50		103.50	67.50			5720.43
3 Utilit/mac.	1702.01		748.88	874.80	141.00		69.00	45.00			3580.69
Unl Engineer											
1 Steward Cook	1100.61		484.27	437.40	70.50		34.50	22.50			2149.78
1 Third Cook	728.43		320.51	437.40	70.50		34.50	22.50			1613.84
2 Utilitymen	1142.73		502.80	874.80	141.00		69.00	45.00			2775.33
Steward										16519.43	16519.43
24											
TOTALS	24554.64	2185.47	14587.35	11217.90	2105.34	2613.67	1163.06	488.34	84.60	16519.43	75517.80
X12 MONTHS	294,655.68	26,225.64	175,048.20	134,614.80	25,264.08	31,364.04	13,932.72	5,860.08	1,015.20	198,733.16	906,213.60

TABLE A-50
TATF-158 COMMERCIAL
CONTRACT MANPOWER COST
(FY 77\$)

Direct Labor Costs

Base Pay	294,656
Non-watch Pay	26,226
Overtime	198,233
Indoctrination & Training	
Training/Lundberg	13,933
Employment Commission	5,860
Special Account	1,015

Fringe Benefits

Retirement	134,615
Life and Health Insurance	25,264
Annual Leave	175,048
Social Security Payroll Tax	24,131
Miscellaneous	
Feinberg	31,364

Total Direct and Indirect Manpower Costs	930,345
P&I Insurance	121,440
MILDET	140,499
MSC Overhead (4% of \$1,192,284) ¹	47,691

Total Commercial Contract Manpower Cost	1,239,975
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¹Based on OMB Circular A-76

Commercial Contract Option
Monthly Costs
AF (510)

	Base Wage	PMR	Vacation	Union	Medical	Life/Death	Training/ Continuing Education	Spec'l Acc't.	Transp. Inst.	Safety/ Ins.	Overline	Total
1 Master	2,700.03	759.72	3,079.07	546.70	196.60		134.25	33.50	30.00	106.95		8,437.62
1 Chief Mate	1,496.79	410.58	2,107.46	596.70	196.60		134.25	33.50	30.00	106.95		5,086.35
2 Second Mate	1,354.33	3,485.36	3,485.36	596.70	196.60		134.25	33.50	30.00	106.95		4,377.68
2 Third Mate	2,427.22	3,485.36	3,485.36	1,193.40	373.20		268.50	27.00	60.00	233.50	5,592.00	7,778.26
1 Deck Officer	1,776.56		1,776.56	522.00	276.50	399.65	30.00	34.49				5,500.80
1 Chief Engineer	2,453.63	687.03	3,208.27	546.70	196.60		134.25	33.50	30.00	106.95	1,242.19	7,282.39
1 1st Asst Engineer	1,496.79	410.58	2,107.46	596.70	196.60		134.25	33.50	30.00	106.95		5,086.35
1 2nd Asst Engineer	1,354.33	3,485.36	3,485.36	596.70	196.60		134.25	33.50	30.00	106.95		4,377.68
1 3rd Asst Engineer	3,485.36	1,019.79	4,400.00	1,790.10	550.00		268.50	27.00	60.00	233.50		12,435.31
2 1st Asst Engineers	2,427.22		2,427.22	1,193.40	373.20		268.50	27.00	60.00	233.50		7,181.03
1 Purser	2,130.05		618.26	440.70	373.55	205.38	30.00	90.00			7,600.43	7,600.43
6 Porter	6,353.10		1,199.70	2,019.60			631.60		100.00		791.03	10,000.00
1 Steward	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 Chief Cook	2,055.00		5,196.70	8,191.59			2,051.60		700.00			37,307.28
1 Chief Baker	2,055.00		5,196.70	8,191.59			2,051.60		700.00			37,307.28
1 Chief Electrician	2,427.22		2,427.22	1,193.40	373.20		268.50		60.00		21,755.39	21,755.39
1 Chief Mach.	2,427.22		2,427.22	1,193.40	373.20		268.50		60.00			5,500.80
1 1st Asst Electrician	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Mach.	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Ref.	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Steward	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Baker	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Electrician	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Mach.	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Ref.	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Steward	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Baker	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Electrician	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Mach.	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Ref.	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Steward	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Baker	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Electrician	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Mach.	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Ref.	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Steward	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Baker	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Electrician	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Mach.	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Ref.	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Steward	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Baker	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Electrician	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Mach.	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Ref.	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Steward	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Baker	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Electrician	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Mach.	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Ref.	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Steward	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Baker	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Electrician	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Mach.	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Ref.	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Steward	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Baker	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Electrician	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Mach.	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Ref.	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Steward	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Baker	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Electrician	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Mach.	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Ref.	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Steward	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Baker	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Electrician	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Mach.	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Ref.	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Steward	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Baker	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Electrician	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Mach.	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Ref.	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Steward	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Baker	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Electrician	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Mach.	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Ref.	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Steward	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Baker	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Electrician	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Mach.	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Ref.	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Steward	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Baker	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Electrician	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Mach.	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Ref.	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Steward	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Baker	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Electrician	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Mach.	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Ref.	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Steward	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Baker	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Electrician	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Mach.	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Ref.	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Steward	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Baker	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Electrician	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Mach.	1,496.79		1,496.79	336.60			100.00		30.00			1,963.08
1 1st Asst Ref.	1,496.79		1,496.79	336.60			100.00		30.00			1,

Table 11-A

ANNUAL COMMERCIAL CONTRACT MANPOWER ECONOMIC COSTS: AF
(Thousands of FY '77 dollars)Number of Ships in Fleet: 1

DEPARTMENT	ANNUAL ECONOMIC COST PER SHIP	ANNUAL ECONOMIC COST FLEET
A. Direct Labor Costs		
1. Regular Wages ^{1/}	\$ 1,135	\$ 1,135
2. Overtime ^{2/}	804	804
3. Relief Officers ^{3/}	3/	3/
4. Indoctrination & Training ^{4/}	160	160
B. Fringe Benefits		
1. Retirement	432	432
2. Life & Health Insurance	32	32
3. Annual Leave	523	523
4. Social Security Payroll taxes	89	89
5. Miscellaneous ^{5/}	58	58
TOTAL	\$3,233	\$3,233

^{1/}Includes base wages plus non-watch pay for full crew. Includes one radio officer, the rest are accounted for in military detachment.

^{2/}Includes overtime and premium pay.

^{3/}This ship incurred no relief officer expense during FY '77.

^{4/}Includes "Training/Landberg", "Employment Commission" and "Special Account" categories.

^{5/}Includes Feinberg, Transportation Institute and Safety/En categories.

Source: Maritime Administration, Maritime Contract Impact System, Personnel Cost Report.

Table A-52 TAF-58 Fleetwide
Commercial Contract Manpower
Cost From JMC Table 11-A

Commercial Contract Option
Manpower Costs
AO (1961)

Monthly

	Base Wage	IFA	Vacation	Union	Medical	Felinberg	Training/ Lundberg	Employment Commission	Special Account	Overtime	Total
1 Master	3,290.88	921.52	3,121.39	883.89	232.20	948.67	106.80	16.50			9,521.85
1 Chief Mate	2,000.64	502.61	1,073.47	559.03	232.20	551.72	106.80	16.50			6,104.77
1 Second Mate	1,039.90	1,745.34	1,745.34	694.17	232.20	501.46	106.80	16.50			4,043.17
2 Third Mate	3,190.28		3,033.58	859.02	464.40	986.40	213.60	33.00		7,206.79	8,728.28
Deck Officers											
1 Chief Engineer	2,821.70	799.17	2,408.77	1,300.31	187.50	1,041.46	60.00	18.78	28.20		9,846.04
1 1st Asst's Engineer	1,940.59	543.42	1,030.52	894.74	107.50	751.22	60.00	18.78	28.20		6,341.47
1 2nd Asst's Engineer	1,725.28		1,723.43	795.02	107.50	697.77	60.00	18.78	28.20		5,275.90
1 3rd Asst's Engineer	3,019.04	845.62	3,016.60	1,391.56	375.00	1,276.60	120.00	37.56	56.40		10,099.14
5 3rd Asst's Engineer	7,549.60		7,541.51	3,470.91	937.50	3,001.49	300.00	93.90	141.00		23,133.91
1 Engine Officers										11,039.96	11,039.96
1 Purser/BOA	1,355.57		640.88	450.50	125.70	211.44	42.00	30.00	90.00		2,406.49
1 Purser										948.90	948.90
1 Steward	1,211.91		739.26	480.60	175.70		42.00	30.00			2,692.47
3 Quartermaster	2,685.96		1,638.43	1,441.46	377.10		126.00	90.00			6,359.29
23 Able Seamen	20,123.85		17,275.54	11,053.79	2,489.10		946.00	600.00			48,000.20
3 Ordinary Seamen	2,000.41		1,269.05	1,441.80	377.10		126.00	90.00			5,106.36
13 Deck										18,271.48	18,271.48
3 Electricians	4,012.74		2,447.77	1,441.80	377.10		126.00	90.00			6,495.43
3 Public, Jr. Engineers	2,952.50		1,801.27	1,441.80	377.10		126.00	90.00			6,789.07
3 Public, Jr. Engineers	3,279.63		2,001.57	1,441.80	377.10		126.00	90.00			7,335.10
3 PWT	2,604.05		1,601.16	1,441.80	377.10		126.00	90.00			6,160.91
1 Chief Purserman	1,223.04		746.09	480.60	125.70		42.00	30.00			2,647.30
2 2nd Purserman	2,178.28		1,328.75	964.20	251.40		84.00	60.00			4,863.63
2 Storekeepers	1,924.68		1,173.53	640.20	231.40		84.00	60.00			4,055.01
3 Wipers	2,409.66		1,469.89	1,441.80	377.10		126.00	90.00			5,291.45
Und. Engineer										14,423.89	14,423.89
1 Chief Steward	1,216.77		742.23	480.60	125.70		42.00	30.00			2,647.30
1 Chief Cook	1,051.20		641.23	480.60	125.70		42.00	30.00			2,370.73
1 Cook and Baker	1,800.44		1,110.47	903.20	251.40		84.00	60.00			4,247.53
1 Asst's Cook	910.22		555.23	469.60	125.70		42.00	30.00			2,143.75
10 Utilitymen	10,725.44		6,542.52	7,449.59	2,011.20		672.00	440.00			20,190.75
Steward										11,000.04	11,000.04
Total	91,254.15	3,481.34	65,616.14	45,221.43	12,046.40	9,563.23	4,150.00	2,430.30	372.00	63,077.04	294,731.35
x 12 months	1,095,049.80	44,200.08	788,119.41	542,753.10	145,036.88	119,558.76	49,896.00	29,163.60	4,464.00	766,536.30	3,594,776.20

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Table A-53 TAO-105
Commercial Contract Manning
and Related Costs From JMC Backup Tables

Table 11-B

ANNUAL COMMERCIAL CONTRACT MANPOWER ECONOMIC DATA: AO
(Thousands of FY 77 Dollars)

Number of Ships in Fleet: 16

<u>DEPARTMENT</u>	<u>ANNUAL ECONOMIC COST PER SHIP</u>	<u>ANNUAL ECONOMIC COST FLEET</u>
<u>A. Direct Labor Costs</u>		
1. Regular Wages ^{1/}	\$ 1,139	\$18,228
2. Overtime ^{2/}	767	12,265
3. Relief Officers	14	231
4. Indoctrination & Training ^{3/}	84	1,336
<u>B. Fringe Benefits</u>		
1. Retirement	543	8,684
2. Life & Health Insurance	145	2,321
3. Annual Leave	788	12,610
4. Social Security Payroll taxes	82	1,308
5. Miscellaneous ^{4/}	120	1,913
<u>TOTAL</u>	<u>\$ 3,685</u>	<u>\$58,895</u>

^{1/}Includes base wages plus non-watch pay for full crew. Does not include radio officers, who are accounted for in military detachment.

^{2/}Includes overtime and premium pay.

^{3/}Includes "Training/Lundberg", "Employment Commission" and "Special Account" categories.

^{4/}Feinberg, Transportation Institute and Safety/Ed categories.

^{5/}Calculated on numbers before rounding.

Source: Maritime Administration, Maritime Cost Impact System, Personnel Cost Report.

Table A-54 TAO-105 Fleetwide
Commercial Contract Manpower
Cost From JMC Table 11-B

Commercial Contract Option
Manpower Costs
ATF (1960)

	Base Rate	WMA	Vacation	Pension	Medical	Felinberg	Training/ Fund	Equipment Cost	Spec. Acc't	Suppl. Equipment	Overline	Total
1 Master	3,097.36	167.20	2,256.97	645.85	232.20	109.59	121.00	16.50	20.20	30.00		7,881.55
1 Chief Mate	1,700.50	176.20	1,230.15	346.50	232.20	106.66	121.00	16.50	20.20	30.00		4,800.07
1 2nd Mate	1,537.25		1,119.23	300.41	232.20	95.37	121.00	16.50	20.20	30.00	4,067.17	4,067.17
Deck Officers												
1 Chief Engineer	2,076.54	405.16	2,259.64	1,325.52	187.50	86.89	60.00	10.75	20.20			4,860.54
1 1st Asst's Engineer	1,700.50	176.20	1,115.09	703.69	187.50	517.91	60.00	10.75	20.20			4,465.07
1 2nd Asst's Engineer	1,537.25	130.45	1,207.58	700.37	187.50	677.77	60.00	10.75	20.20			4,230.45
Engine Officers												
6 Able Seamen	5,100.60		2,203.02	2,624.40	711.00		252.00	100.00			3,041.35	11,230.40
1 Ordinary Seaman	675.12		297.05	437.40	118.50		42.00	10.00			1,001.05	1,001.05
Deck												
1 Chief Electrician	1,337.12		500.33	437.40	118.50		42.00	30.00				2,435.35
3 Others (Electric)	2,772.25		1,220.52	1,312.20	355.50		126.00	90.00				5,800.56
3 Engine Utilitymen	2,997.35		1,317.96	1,312.20	755.50		126.00	90.00				6,412.01
Engine												
1 Chief Steward	1,958.50		465.77	437.40	118.50		42.00	30.00			1,001.05	2,435.35
1 2nd Cook/Baker	852.60		392.74	437.40	118.50		42.00	30.00				1,873.24
2 Utilitymen	1,300.72		509.91	878.40	237.00		86.00	30.00				3,056.43
Steward												
20 Totals	28,729.78	3,055.99	16,570.81	12,093.57	3,392.10	2,922.19	1,301.40	615.75	160.20	90.00	2,230.06	60,000.00
x 12 months	344,757.36	36,671.08	198,845.06	145,122.84	40,705.20	35,066.28	15,616.00	7,389.00	2,030.40	1,080.00	229,740.16	1,057,132.00

Source: Maritime Administration, Maritime Contract Impact System, Personnel Cost Report.

Table A-55 TATF-158
Commercial Contract Manning
and Related Costs From JMC Backup Tables

Table 11-C

ANNUAL COMMERCIAL CONTRACT MANPOWER ESTIMATES: ATE
(Thousands of 1977 dollars)

CATEGORY	Number of Ships in Fleet: 7	
	ANNUAL ECONOMIC COST PER SHIP	ANNUAL ECONOMIC COST FLEET
A. Direct Labor Costs		
1. Regular Wages/	\$ 321	12,670
2. Overtime ^{2/}	230	1,608
3. Relief Officers	7	49
4. Indoctrination & Training ^{3/}	25	175
B. Fringe Benefits		
1. Retirement	146	1,023
2. Life & Health Insurance	41	285
3. Annual Leave	199	1,393
4. Social Security Payroll Taxes	23	160
5. Miscellaneous ^{4/}	32	245
TOTAL	\$1,017	\$7,609

^{1/}Includes base wages plus non-watch pay for full crew. Does not include radio officers, who are accounted for in military detachment.

^{2/}Includes overtime and premium pay.

^{3/}Includes "Training/Lundberg", "Employment Commission" and "Special Account" categories.

^{4/}Includes Feinberg, Transportation Institute and Safety/EA categories.

^{5/}Calculated on numbers before rounding.

Source: Maritime Administration, Maritime Contract Impact System, Personnel Cost Report.

Table A-56 TATF-158 Fleetwide
Commercial Contract Manpower
Cost From JMC Table 11-C

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